

The Essential

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Guide to Windows Server 2008

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Windows Server® 2008

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Since the beginning of the widespread adoption of computer technology in business there has been a common theme. Hardware and software technologies continually advanced, leapfrogging each other as new technologies were developed and deployed. This meant that IT was dealing constantly with one or two common issues; the first, and most annoying, was that software applications required the absolute newest, fastest, and most capable computers, and often were only marginally happy on that hardware; always wanting a little more power and capability than the current state-of-the-art hardware was able to deliver. The second was the reverse; hardware capabilities outstripped software requirements and IT felt that they were paying more money than they needed to for capabilities that they couldn't make use of in their server purchases.

In 2008 technology professionals find themselves at an interesting juncture; hardware and software technologies coming together to deliver a complimentary set of capabilities that allow for the deployment of incredibly powerful, mission-critical, line-of-business applications that are scalable, cost-effective, and can fully and efficiently utilize the power and capabilities of both hardware and software.

User Needs Drive Server Market

Let's look at the major user needs that are driving the server market in 2008; server consolidation, application consolidation, database-driven solutions, and business intelligence. These market forces all require the same underlying support; a powerful server operating system that can take full advantage of current and future hardware technologies, and, of course, hardware that can deliver on the promise of the operating system.

That operating system is arriving in the form of Windows Server 2008. With this next generation of the Windows Server system, IT is getting the answer to many of questions they have been posing over the last

few years. Microsoft has continued to build on the ease-of-use delivered by the Windows Server platform, by adding features such as the new Server Manager console, which significantly simplifies the tasks involved in server setup and configuration while providing a central location for ongoing server management. And a new feature, Windows PowerShell, delivers a command-line control interface that allows an administrator to build command-line driven scripts to automate common and repetitive administrative tasks. Additional wizards have been added to simplify complex tasks such as installing clusters and deploying the operating system in network environments. While ease-of-use continues to improve, the operating system is also more secure and reliable than in previous versions.

Security is always an underlying concern for system administrators and with Windows Server 2008 they are getting an operating system that has been hardened against common security problems and system failures. The addition of technologies like Network Access Protection (NAP) means that administrators are able to lock down access to their servers and take a major step to ensure that only authorized users gain access to data on protected servers. While not a specific security solution, the Windows Server 2008 Server Core installation means that it is possible to deploy specific purpose servers that don't get a GUI or many of the points of potential attack that need to be secured.

Bring on Hyper-V

But if we were going to pick one feature of Windows Server 2008 that will have the greatest impact on IT, it has to be Windows Server Hyper-V. HyperV is a hypervisor-based virtualization technology. With the ability to completely virtualize server hardware, Hyper-V becomes the enabling software technology for server consolidation, application consolidation, server scalability, and application availability, giving an administrator the ability to deliver virtual SMP servers to applications and operating systems as necessary.

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Hyper-V is not limited to virtualizing Windows Server; Linux and other operating systems running on x86 (both 32 and x64-bit) architectures can also be supported on the same hardware running Windows Server 2008 Hyper-V as the virtualization engine. And keep in mind that virtualization is not restricted to running high-performance, cutting-edge applications. Server consolidation often means trying to keep older server technologies and in-house applications running as well. So a virtualized server, running in a partition on a current, state-of-the-art technology machine, may be running a server operating system and application that is seven or eight years old.

This powerful software virtualization technology needs hardware that is equal to the task to really deliver optimal solutions to the IT user. This is where Intel's processor technology steps up to the plate with the latest generation of multi-core server processors and Intel Virtualization Technology (Intel VT).

Processors that include Intel VT (and the operating systems software that supports it) can take advantage of a set of processor hardware enhancements that allow the offloading of workloads to the system hardware that would otherwise be handled solely in software, improving performance, in some cases, to near-native performance levels. With the right software, Intel VT is also able to improve the reliability of virtualization, making for more reliable server consolidation solutions.

Multi-Core Technologies

Multi-core technologies also come to the fore with the new server operating system. While Windows Server has supported SMP systems since its introduction, applications that were able to take full advantage of SMP have been fairly rare and limited in scope. The introduction of multi-core processors exacerbated the problem from the point of view of IT; they were able to get significantly more powerful systems and lower relative costs, but there were few server applications that could take full advantage of the processor power being delivered. This is another area where virtualization really becomes a cost-effective solution; the capabilities built

into the processors in the Intel-based servers already being purchased can now be better utilized by deploying Windows Server 2008 Hyper-V.

The Quad-Core Intel® Xeon® processor 7300 series, based on the Intel® Core™ microarchitecture, offers leading scalable performance and best-in-class virtualization for server consolidation. Tests have shown an increase of more than double the performance in virtualization and almost triple the performance benefit per watt of consumed power, over previous generations. The top of the line Quad-Core Intel Xeon 7300 series processors provide faster high-speed interconnects, support for larger system memory implementations and support for up to 32 sockets—which means 128 CPU cores using high-performance quad-core processors.

These advances mean that it is possible for OEMs to build server systems that can be used to virtualize dozens, if not hundreds of physical servers into a single platform, in many cases with no apparent performance hit to the end-users of the services provided by those virtualized servers. And it also opens the way for vendors to build next-generation applications that take full advantage of the servers and operating systems that are becoming available today.

Choice of Hardware Vendor Critical

But with server and application consolidation with Windows Server 2008 and current Intel VT (enabled?) multi-core processors it means that the choice of hardware vendor will become progressively more critical. As IT builds bigger, more consolidated systems the choice of OEM will become the driving factor in the selection of server hardware. The enterprise server IT environment has truly come full circle. From the days of big mainframe computers with enterprise service contracts and responsibilities we have worked our way through the independent adoption of all sorts of computing technologies and now find ourselves back to the point where the service and support model provided by the server vendor has become paramount in the selection of enterprise servers.

This is where the experience and history of a vendor such as Unisys becomes valuable to the IT implementation. Unisys offers enterprise-class hardware for your server implementation, starting with their midrange ES3000 Enterprise Servers which offer 2- and 4-way high-performance mid-point server solutions, and ranging up to their ES7000/one Enterprise server, a rack mounted solution that is scalable to 32 Intel multi-core Xeon processors and 512 GB of memory. The server can be set up with up to eight partitions or run as a single 32-way computer, if your operating system choice supports it. It can be deployed as a single-server solution that can grow to meet the enterprise computing needs of your organization, adding capabilities as you consolidate more of your standalone servers and applications to this single server.

Many mission-critical solutions can benefit from architectures that incorporate scalable servers and other components designed for high efficiency and availability. When these best-of-breed components are combined using accepted methodologies, such as centralization and consolidation, and technologies, such as virtualization, superior results can be achieved. In enterprise Exchange environments, for instance, utilization and reliability is increased; footprint, power and cooling, and management expense is reduced; and total cost of ownership is optimized compared to more traditional federated topologies. Unisys also brings significant experience to the IT world in the process of building mixed workload consolidation solutions, as well as dedicated consolidation solutions for enterprise-scale server applications such as SQL Server. While the task of building a consolidated server environment can appear to be a straightforward one, if the enterprise is doing more than just consolidating file and print services, there are many issues that need to be addressed before and during the consolidation process that are far from clear. Attempting such a project using the trial and error method is unlikely to be cost-effective and would show significant benefits, both in costs and progress, from making use of the skills and expertise of an organization that has specialized in these types of migration.

Unisys server hardware ships with the Unisys Server management technology, which is an autonomic server monitoring tool designed to keep the server running at its peak health and performance. This tool does system monitoring, self-healing, and security and it improves high-availability and reliability. The tool can also do asset management and link to Unisys and third-party systems and operations management tools.

With Unisys solutions, technology, and deep mission-critical expertise, IT organizations can reduce the complexity of their IT infrastructure and deployments both by consolidating servers, services, and applications into smaller numbers of servers and by utilizing the high-availability, high-reliability service and support tools available to the user. A look at the software licensing models that are evolving in the marketplace, starting with Windows Server 2008, will show IT managers that forward-looking vendors are encouraging the use of large-scale virtualized environments as the direction that future environments should pursue.

With the release of Windows Server 2008 and current generation processor and server hardware, IT pros face a brand new set of challenges to their day-to-day jobs. The drive for IT will strongly focus on how to get jobs done more efficiently, how these new technologies can best be utilized, what vendors should be partnered with, and what direction the computing environment will be taking.

This next generation of server and operating system implementations offers an IT department the chance to make revolutionary leaps in the capabilities of the services they offer to their business, rather than the simple evolutionary changes that they have become accustomed to.

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Unisys Enterprise Servers:

http://unisys.com/products/enterprise__servers/index.htm

Microsoft Windows Server 2008

<http://www.microsoft.com/windowsserver2008/default.aspx>

Microsoft Windows Server 2008 Hyper-V

<http://www.microsoft.com/windowsserver2008/virtualization/default.aspx>

Intel Virtualization Technology

http://www.intel.com/technology/platform-technology/virtualization/index.htm?iid=technology_virtualizationdescription+tabs_overview

Intel Multi-Core Technologies

http://www.intel.com/multi-core/index.htm?iid=tech_arch+body_multi-core

Unisys Embraces Virtualization Technology

In the following interview, Mark Feverston, VP, Microsoft Solutions; and Jim Boak, VP, Microsoft Strategic Alliance, talk about how Unisys solutions will incorporate Windows Server 2008.

Q: Mark, Unisys has long been known as a leader in the Windows enterprise computing space. How do you see that Windows Server 2008 will affect the position of Unisys in the marketplace?

Mark: It will enhance it! We have historically relied on Windows Server to provide a scalable operating system platform for our mission-critical, enterprise-class deployments. In fact, our joint engineering relationship with Microsoft dates back to the late 90's when we were one of the earliest supporters and champions of Windows Server Datacenter Edition. With the introduction of Windows Server 2008, we anticipate companies generating new, larger workloads, which is the "sweet spot" for our expertise and our technologies.

Q: What are some of these new workloads you are referring to?

Mark: A number of our enterprise customers have been asking for our assistance in addressing certain infrastructure optimization needs. In response, we have developed a number of solutions that apply our increasing family of server technology with Windows Server 2008 in a number of novel ways. We will have some exciting news around this shortly. But what I can share with you today is that we will be leveraging our extensive infrastructure optimization experience and enterprise server expertise to provide a new, robust and cost-effective solution based on Windows Server virtualization technology for large-scale desktop environments. We will also be announcing a solution for consolidating, securing and managing Microsoft Exchange Server 2007 environments. So stay tuned for more details over the next few months!

Q: That sounds great. But how about Unisys' current value proposition as it relates to server and datacenter consolidation?

Mark: A large proportion of our ES7000 family of servers has been deployed in server consolidation roles. The reason for this is easy to

understand: Unisys mainframe design provides a balanced architecture and economies-of-scale supporting high-volume virtualization of infrastructure resources while reducing environmental and operating costs. In fact, Microsoft continues to be a major consumer of Unisys server technology in both its production as well as development environments.

Q: Jim, as Mark mentioned earlier, Unisys has long had a strategic relationship with Microsoft. But why work with Microsoft in the first place? What is the value of your alliance?

Jim: Through the Unisys and Microsoft Solutions Alliance, our two companies have established a strategic relationship that enables us to jointly drive high-value opportunities for our customers. By combining the deep industry expertise of Unisys with the interoperability and familiarity of Microsoft technologies, we are uniquely positioned to offer our enterprise customers the solutions and services that they need to build efficient systems, empower their people, and capitalize on new business opportunities. Our customers have come to expect a seamless experience when they purchase solutions that leverage both Unisys and Microsoft resources. Through our close working relationship, we deliver the exceptional customer experience that our clients demand. For more than 30 years, Unisys has been delivering enterprise-class, mission-critical solutions to maximize the importance of people and technology while driving business success for our clients in challenging industries. Unisys has thousands of successful enterprise customers on the Microsoft platform worldwide. Our alliance with Microsoft delivers significant benefits to our joint customers by providing highly secure, scalable Unisys solutions on the Microsoft platform. We work closely with Microsoft through joint engineering development and sales engagements, and our collaborative efforts are supported by dedicated resources in both companies.



Intel Brings Better Performance to Windows Server 2008

In the following interview, Mark Swearingen, Director of the Microsoft Program Office, talks about how Intel has worked closely with Microsoft to provide a powerful hardware foundation for Windows Server 2008.

Q: Intel has long been known as a leader in the Windows enterprise computing space. How do you see that Windows Server 2008 will affect Intel's position in the marketplace?

Mark: Intel put significant effort into making sure that our server and platforms deliver break-through performance, reliability and efficiency while running Windows Server 2008. Microsoft and outside analysts predict that this will be one of the fastest operating system ramps in Microsoft's history. I'm confident that servers based on Intel's Xeon and Itanium processors will provide the hardware foundation for this technology transition point.

Q: What is Intel's current value proposition as it relates to server and datacenter consolidation? Anything you'd like to add on virtualization technology?

Mark: All of the work that we've done together on Power Management, Virtualization, Security and RAS (Reliability, Availability and Serviceability) translate into high performance, highly efficient servers for the datacenter. And of course, all of Intel's Xeon™ processors and server platforms have the features necessary to run Microsoft's Hyper-V – Intel64, VT and XD bit. We've worked closely with Microsoft to make sure that each of these features provides optimum performance on Windows Server 2008.

Q: Intel has long had a strategic relationship with Microsoft. But why work with Microsoft in the first place? What is the value of your alliance?

Mark: Intel works closely with Microsoft so that we can deliver what our joint customers demand. Our work with Microsoft on Windows Server 2008 started more than five years ago and these activities increased in scope and complexity through the long development cycle. This broad effort included influencing and aligning roadmaps between core operating system areas and architectures, identifying system requirements and features, prototyping and co-developing support for key features and validation and optimization of these features for Intel platforms. All of this work translates into better performance and lower TCO on Intel server platforms running Windows server 2008.

