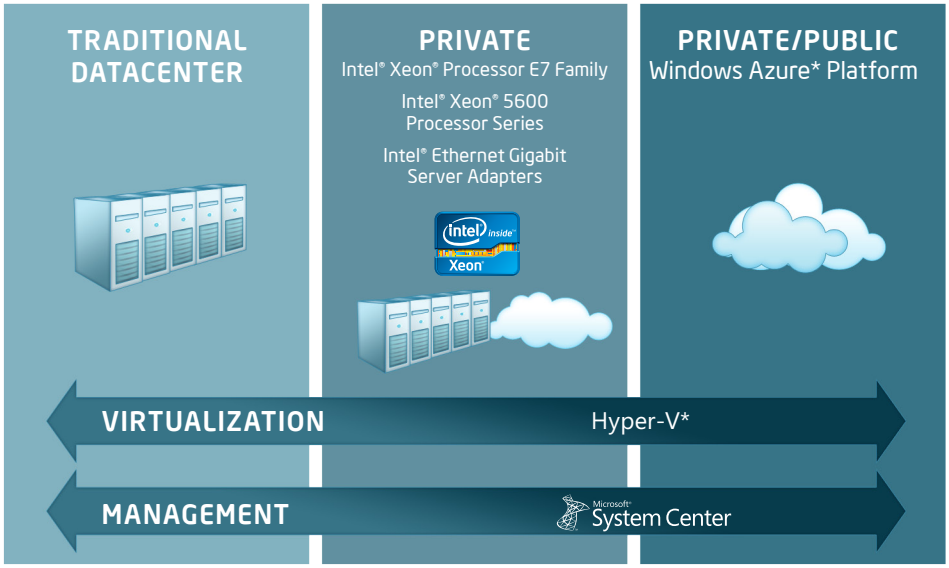
Embrace the Private Cloud with Intel® and Microsoft*

SOLUTION BRIEF

In today's challenging economic climate and competitive business environment, organizations need a greater return on IT investments while maintaining or increasing the level of reliability, availability, and serviceability of IT infrastructures. The private cloud improves IT efficiency by virtualizing and pooling computing resources, providing the benefits of the public cloud without compromising sensitive data and applications. The increased efficiency of the private cloud drives higher levels of resource utilization within each pool and enables organizations to reduce power consumption overall by consolidating the workloads onto fewer and more power-efficient servers. This can reduce costs by lessening the need to add more physical servers and the space, power, and communication infrastructure to host them.

New generation servers based on the Intel® Xeon® processor E7 family or the Intel® Xeon® processor 5600 series, along with Windows Server* 2008 R2 SP1 and Microsoft* System Center, offer transformative business value for private cloud computing through hardware and software enhancements that work together to deliver the benefits of scalable performance, flexible virtualization, and advanced reliability.



intel®

Microsoft®

SCALABLE PERFORMANCE TO CONFIDENTLY RUN ENTERPRISE APPLICATIONS

Servers based on the latest Intel Xeon processor E7 family and Intel Xeon processor 5600 series provide IT organizations with a range of options to meet the performance, headroom, and scalability requirements of highly virtualized and consolidated private cloud infrastructures. By leveraging the power of Intel technology, businesses can begin moving their datacenters to the cloud helping IT administrators and end-users receive an efficient, secure, and simplified experience.

The Intel Xeon processor 5600 series is an ideal choice to scale workloads such as search and web, or cloud-based offerings such as Infrastructure as a Service (IaaS). By automatically regulating power consumption and intelligently adjusting server performance according to application needs, the Intel Xeon processor 5600 series maximizes both energy efficiency and performance.

The Intel Xeon processor E7 family represents the top-of-the-line choice for private clouds where the highest levels of performance, scalability, and reliability are needed. World record 4-way and 8-way x86-based processor performance enables more transactions per server for scalable, data demanding enterprise applications.[1] It also provides scalability up to 80 threads per 4-socket server, and 16 DIMMs per socket. The Intel Xeon processor E7 family 10-core processors deliver a performance improvement of up to nearly 20 percent increase in OLTP performance running Microsoft SQL Server* 2008 R2 Enterprise x64 Edition database on Windows Server* 2008 R2 SP1 Enterprise x64 Edition.[2]

Both the Intel Xeon processor E7 family and the Intel Xeon processor 5600 series are based on the new Intel 32nm microarchitecture which delivers 25 percent more cores and cache within same maximum Thermal Design Power. Featuring Intel® Intelligent Power Technology, it reduces energy costs by automatically shifting the CPU and memory into the lowest available power state, while delivering the performance you need.

FLEXIBLE VIRTUALIZATION MAXIMIZES IT INVESTMENTS AND COST SAVINGS

The hardware and software on servers based on the Intel Xeon processor E7 family or Intel Xeon processor 5600 series along with Windows Server 2008 R2 SP1 Hyper-V*, and System Center work together to enhance the reliability and efficiency of virtualized workloads. Intel® Virtualization Technology (Intel® VT) delivers a unique portfolio of hardware-assist features to enhance server virtualization with the industry's highest virtualization performance, achieving up to 25 percent better virtual machine performance than previous generations.[3] Intel® VT works with Windows Server 2008 R2 SP1 Hyper-V, and System Center to provide maximum system utilization, flexibility, and agility in private cloud infrastructures.

The overall shift towards constant connectivity and cloud computing is driving an explosion of data and an instantaneous demand for information. Increased virtualization of physical servers in the data center has resulted in a more complex environment. To help reduce complexity, businesses can install Intel® Ethernet 10 Gigabit (10GbE) Server Adapters to consolidate multiple 1Gb interfaces into a single 10GbE with native performance and virtualization management. Intel 10GbE also reduces the power consumption per rack, the number of cables and ports needed, and improves bandwidth per server. For example, if you take a virtualized server with 10 1GbE ports and replace the cabling with two Intel 10GbE ports, you could potentially reduce power consumption by 45 percent, reduce infrastructure costs by 15 percent, and double bandwidth per server.[4]

ADVANCED RELIABILITY PROTECTS BUSINESS-CRITICAL ASSETS

Security and reliability are primary considerations when implementing new technology. Intel and Microsoft together provide capabilities at both the hardware and software layers to ensure your data is available and stays protected. The hardware and software on servers based on the Intel Xeon processor E7 family or Intel Xeon processor 5600 series along with Windows Server 2008 R2 SP1 and System Center deliver multiple levels of redundancy and system recovery resulting in more robust application consolidation and higher availability.

Servers based on the Intel Xeon processor E7 family and Intel Xeon Processor 5600 series provide IT with a range of options to meet the reliability requirements of highly virtualized and consolidated private cloud infrastructures. The Intel Xeon processor 5600 series is an ideal choice for workloads where standard levels of reliability are required, while the Intel Xeon processor E7 family represents the premier choice for workloads that demand the highest levels of reliability.

The Intel Xeon processor E7 family sets a new standard for reliability with more than 20 RAS features including support for Machine Check Architecture, Intel® QuickPath Interconnect (QPI), and Intel® Scalable Memory Interconnect (SMI). Windows Server 2008 R2 SP1 works with these features to deliver unprecedented levels of reliability, data integrity, improved system availability, and enhanced serviceability.

Intel Xeon processor E7 family based servers powered by Windows Server 2008 R2 SP1 deliver robust data integrity including error detection, correction, and containment across all major components and communication pathways. These capabilities use advanced methods such as corrupt data tagging, viral mode, parity checking, and Intel Quick Path Interconnect CRC checking.

With multiple levels of redundancy and operating system-assisted system recovery from certain uncorrectable errors, servers powered by the Intel Xeon processor E7 family and Windows Server 2008 R2 SP1 help achieve improved system availability. Machine Check Architecture recovery provides automatic recovery from otherwise uncorrectable errors. Intel Scalable Memory Interconnect and Intel QuickPath Interconnect boost availability through automatic interconnect error detection and recovery, enabling the platform to identify problems and failover or modify itself to keep running. In addition, systems can automatically detect failing components and failover to spare components including processors, memory, and I/O hubs.

Servers powered by the Intel Xeon processor E7 family and Windows Server 2008 R2 SP1 deliver enhanced serviceability with predictive failure analysis that enables problematic components to be identified and replaced before they fail. For increased security, Intel® Advanced Encryption Standard-New Instruction (Intel® AES-NI) accelerates the AES encryption algorithm by implementing some of the complex algorithm steps in hardware. Encryption of data can now happen faster, with greater security and more frequency enabling more secure transactions, and encouraging full disk and database encryption.

INTEL AND MICROSOFT PRIVATE CLOUD SOLUTION FOR BUSINESS AGILITY AND IT EFFICIENCY

Regardless of a business's size, focus, or industry, cloud computing is emerging as a new way to save costs and increase agility and scalability. Intel and Microsoft are committed to existing cloud solutions and future cloud innovation—helping businesses move to the cloud today and plan for the cloud in the future.

Intel and Microsoft have worked together for more than two decades to ensure the utmost reliability, availability, and serviceability for business-critical computing. With the Intel Xeon Processor E7 family or the Intel Xeon Processor 5600 series running Windows Server 2008 R2 SP1, your organization can gain an end-to-end private cloud environment that is scalable and secure. Take advantage of proven Intel hardware and familiar Microsoft tools to create a private cloud solution that can be tailored to meet compute, storage, and network needs.

RESOURCES AND LINKS

- Intel Xeon Processor E7 Family: **www.intel.com/products/server/processor/xeonE7**
- Intel Xeon Processor 5600 Series: **www.intel.com/itcenter/products/xeon/5600**
- Windows Server 2008 R2 SP1: **www.microsoft.com/windowsserver2008**

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[1]The claim is based on all servers currently shipping on 4/10/11. For the latest benchmark results, visit www.spec.org, www.tpc.org, www.sap.com/benchmark or www.vmware.com. 173,961.8 QphH @ $1.37/QphH @ 1000GB (N/A)

[2]From "Database performance on TPC Benchmark* E" on http://www.intel.com/performance/server/xeonE7-4800/server.htm

[3]Up to 25% better virtual machine performance claim based on SPECvirt_sc2010 benchmark comparing next generation Intel® Xeon® processor E7-4870 (30M cache, 2.40GHz, 6.40GT/s Intel® QPI, formerly codenamed Westmere-EX) scoring 2,540 @ 162VMs to X7560 (24M cache, 2.26GHz, 6.40GT/s Intel QPI, formerly codenamed Nehalem-EX) scoring 2,024 @ 126VMs. Source: Intel SSG TR#1118.

[4] Source: Intel 10GbE ROI Calculator. This ROI calculator is a cost comparison for a highly virtualized solution, using multiple 1GbE connections versus a dual port 10GbE implementation. http://www.event-management-online.de/LAD/calculator.aspx

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