vmware | intel

The Foundation of Virtualization

BRING THE BENEFITS OF VIRTUALIZATION TO YOUR BUSINESS-CRITICAL APPLICATIONS

You may be well aware that virtualization can help you simplify and consolidate your computing infrastructure to drive down costs and free up resources in your datacenter. What you may not know is that VMware vSphere™ 4 running on the latest Intel® Xeon® processor-based servers now provides the performance, scalability and availability you need to run your business-critical applications, such as high-volume database, ERP, CRM, business intelligence and productivity applications.

"THANKS TO THE INTEL® XEON® PROCESSOR 5500 SERIES AND VMWARE VSPHERE,™ SETAO IS NOW ABLE TO PROVIDE MAINFRAME-CLASS QUALITY OF SERVICE AND ENSURE EASY DEPLOYMENT OF NEW VIRTUAL MACHINES AND APPLICATIONS WHILE REDUCING TOTAL COST OF OWNERSHIP."

— OLIVIER PARCOLLET, CHIEF TECHNOLOGY OFFICER, SETAO

The benefits can be truly transformative. Instead of being tied to specific hardware systems, your applications run on a dynamic infrastructure that gives you unprecedented control over your systems and workloads. You can reduce server counts by a factor of five or more,[1] deploy applications in minutes instead of weeks or months, and move running virtual machines from one physical server to another without downtime. With these capabilities, you can:

- **Slash capital and operational costs** by as much as 50 percent or more per application.[2]
- **Deliver a better and more reliable user experience** by dynamically adapting server resources to application workloads and by implementing simpler and more comprehensive high availability and disaster recovery solutions.
- **Increase business and IT innovation,** first by freeing up a higher percentage of your IT budget for new development, and second, by creating more agile and cost-effective development and staging environments so you can introduce new capabilities more quickly and with less effort.

UNCOMPROMISING PERFORMANCE FOR YOUR CORE BUSINESS APPLICATIONS

Application performance used to be an issue in virtualized environments. Not anymore. VMware vSphere and the latest Intel Xeon processor-based servers deliver up to 275 percent better[3] performance in a virtualized environment than previous generations. With these advances, approximately 95 percent[4] of applications can now match or even exceed native performance, and if you are moving applications from older dedicated servers, you can expect to see dramatic improvements in server capacity, throughput and response times.

Intel® Virtualization Technology◊ (Intel® VT) enables this near-native performance by providing hardware assists for virtualization functions across the entire server platform, including processors, chipsets and networking devices. In tandem with software optimizations in VMware vSphere, it greatly reduces the performance overhead of virtualization and cuts round-trip virtualization latencies by up to 40 percent.[5]

A MORE DYNAMIC AND RESILIENT INFRASTRUCTURE

VMware vSphere running on Intel Xeon processor-based servers is the leading platform for building cloud infrastructures that give you fully automated control over your workloads and service levels. You can add server resources to running virtual machines, which allows you to scale performance as workloads change. You can also move running virtual machines from one physical host to another in minutes and without downtime for workload balancing and failover.

Intel® Virtualization Technology FlexMigration (Intel® VT FlexMigration) and VMware Enhanced VMotion™ provide a proven, enterprise-ready live migration solution. They also ensure migration compatibility among current and future Intel Xeon processor-based servers, so you can continuously grow your pool of virtual resources. This capability has been extensively tested with diverse systems and demanding workloads, both in laboratory settings and across thousands of production deployments in business-critical customer environments. It provides the foundation for enterprise-class high availability, fault tolerance and disaster recovery.

- **High Availability.** VMware High Availability (HA), when accompanied with Intel VT FlexMigration, allows you to monitor your environment and, when necessary, automatically restarts virtual machines on servers that have spare capacity. It minimizes downtime and IT service disruption, while eliminating the need for dedicated stand-by hardware.
- **Fault Tolerance.** VMware Fault Tolerance (FT) takes advantage of Intel VT FlexMigration, allowing you to take high availability to the next level by providing fully mirrored operation with instantaneous failover to eliminate even the smallest IT service disruption.
- **Disaster Recovery.** VMware vCenter Site Recovery Manager™ allows you to automate failover for an entire datacenter. It is far simpler than traditional solutions, eliminating the need for duplicate hardware infrastructure and complex, error-prone manual processes. It also makes it easy to configure and test your failover plan without disrupting your production environment.

VIRTUALIZATION AND MULTICORE SERVER PROCESSORS: BETTER TOGETHER

Server performance is growing faster than ever as Intel integrates increasing numbers of high-performance processing cores into the Intel® Xeon® processor family. Even large, business-critical applications can rarely utilize all the resources provided by the latest generation of highly scalable servers. Virtualization with VMware vSphere™ provides a solution, unleashing the full system potential by allocating resources among multiple virtual machines.

As one example, Microsoft Exchange* only scales well to eight cores. By using VMware vSphere to host multiple instances of Exchange per physical server, VMware and EMC were able to host 16,000 mailboxes on a four-socket (16-core) Intel Xeon processor-based server, greatly exceeding the scalability of the un-virtualized server.

For details, read the VMware and EMC white paper at: **http://www.vmware.com/files/pdf/resources/16000_exchange_on_vmware.pdf**

LOWER CAPITAL AND OPERATING COSTS

VMware vSphere and the latest Intel Xeon processor-based servers support more than twice[3] the virtual machine density of previous generations, enabling higher consolidation ratios to drive down space, power and cooling requirements in your datacenter. They also increase your savings by intelligently tailoring energy consumption to match workloads. Intel® Intelligent Power Technology can reduce power consumption up to 18 percent[6] per server by independently optimizing the power consumption of each core. VMware Distributed Power Management (DPM) extends power management across the entire datacenter, by automatically redistributing virtual machines onto a smaller number of servers when workloads are light and powering down unused systems.

FASTER APPLICATION DEVELOPMENT

Application architectures are evolving in fundamental ways to help business adapt more quickly to changing needs. Large, monolithic applications are giving way to distributed, loosely coupled software components based on service oriented architecture (SOA) and Web 2.0 technologies.

VMware vSphere running on Intel Xeon processor-based servers provides an ideal platform for supporting this new software model. You can:

- **Develop, test, stage and integrate new functionality more quickly** by eliminating the costs and delays of purchasing and manually provisioning physical servers.
- **Automate your release cycles and deploy changes to production in minutes.**
- **Extend high availability** across all your distributed systems and components simply and cost-effectively to ensure uninterrupted operations.

BROAD ISV SUPPORT

The overwhelming majority of independent software vendors (ISVs) provide full technical support for applications running on VMware vSphere and Intel Xeon processor-based servers, including HP, IBM, Microsoft, Oracle, SAP, Fujitsu and many others. For a complete listing of the thousands of supported software applications, please visit the VMware Web site at: www.vmware.com/solutions/business-critical-apps/isv-support.html

BREAKTHROUGH POWER AND RESILIENCE AT THE HARDWARE LEVEL: INTEL® XEON® PROCESSOR 7500 SERIES-BASED SERVERS

The latest Intel® Xeon® processor 7500 series-based servers provide an exceptionally robust, high-value hardware solution for business-critical applications. A single eight-socket server will support up to 64 cores, 128 execution threads and two terabytes of memory, providing tremendous capacity for enterprise workloads.

This new processor family also provides more than 20 new reliability, availability and serviceability (RAS) features, enabling levels of data integrity and system resiliency never before seen on industry-standard servers. In combination with VMware high availability and disaster recovery solutions, Intel Xeon processor 7500 series-based servers provide the highly scalable and resilient foundation businesses need to virtualize and consolidate their most business-critical workloads with confidence.

"I ACTUALLY SLEEP BETTER AT NIGHT KNOWING THAT IF A PHYSICAL SERVER FAILS, THAT DB2 INSTANCE WILL RESTART ON ANOTHER SERVER THANKS TO VMWARE HA."

— MICHAEL HOFF, SYSTEMS ADMINISTRATOR, OMIG

MOVING FORWARD WITH CONFIDENCE

Virtualizing complex, business-critical applications does not have to disrupt your operations or introduce excessive cost or risk. In fact, introducing virtualization during planned hardware or software upgrades can reduce cost and effort for the upgrade by enabling quick, low-cost provisioning of test environments. With the time saved, you can test and validate the robustness and value of the virtualized environment. The new solution can then be deployed into production in minutes to avoid the disruptions that are typical with traditional upgrades.

Cloud computing through comprehensive datacenter virtualization and automation is the wave of the future. It can bring enormous value to your business through cost savings, enhanced business agility and more reliable IT services. Intel and VMware offer industry-leading solutions today that you can deploy with confidence to virtualize even your most business-critical applications. The two companies are also synchronizing future developments to deliver next-generation cloud computing capabilities that will help you further streamline and automate your datacenter so you can continue to support your business more effectively and at lower cost.

Learn more today by contacting your VMware or Intel representative.

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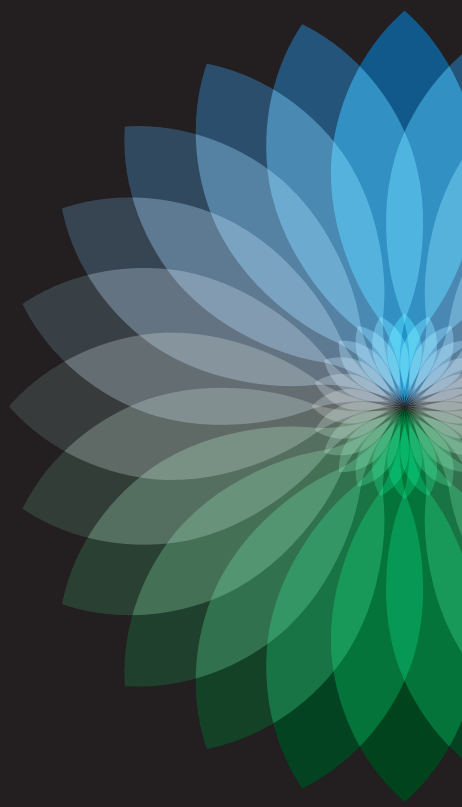

◊ Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM) and, for some uses, certain platform software enabled for it. Functionality, performance or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

[1] Based on typical VMware customer engagements. Actual c onsolidation ratios will vary based on workloads, configurations and IT policies.

[2] Based on VMware analysis of a typical customer environment. Actual cost savings may vary.

[3] Performance results on published results for the VMmark benchmark. Test configurations and results: HP Proliant ML370 G5 server platform with Intel Xeon processors X5470 3.33GHz, 2x6MB L2 cache, 1333MHz FSB, 48GB memory, VMware ESX® V3.5.0 Update 3 Published at 9.15@ 7 tiles vs Fujitsu RX300 S5 server platform with Intel® Xeon® processors W5590, 3.33 GHz, 8MB L3 cache, 6.4QPI, 96GB memory (12x8GB DDR3), VMware ESX Build 164009. Performance measured at 25.16@ 17 tiles. For information, visit http://www.vmware.com/products/vmmark/results.html

[4] Source: Survey of 1038 VMware customers, September 2008.

[5] Source: Intel internal measurements. Intel® Xeon® processor 5500 series (Nehalem) vs. Intel® Xeon® processor 5400 series.

[6] Source: Intel estimates as of Nov 2008. Energy-consumption comparisons measured while running SPECjbb2005 bops (business operations per second). Results have been estimated based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance.

Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit www.intel.com/performance/resources/limits.htm.

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