



Server Virtualization Turbocharged by AMD® Virtualization

Paravirtualization Delivers the Power of Hardware Virtualization

Server virtualization has become a key requirement in the enterprise because of an urgent need to focus on reduced TCO for enterprise computing. Each server in the data center today costs about \$10-\$15,000 per year to run, including provisioning, maintenance, power and management. Moreover, most servers are utilized at less than 10% of capacity.

Server virtualization is achieved by inserting a thin layer of software – a hypervisor – between the OS and the underlying hardware to allow multiple OSes (and their applications) to share a single server. The virtualized platform manages all hardware, including the CPU, memory, and I/O devices, to ensure that each guest OS can safely access shared resources with resource guarantees in the form of a per-virtual machine SLA.

Virtualization increases utilization, allowing multiple virtualized servers to share each system, cutting both per-server capital cost and operational costs. It also delivers savings to dev/test and UAT environments, allows new applications to be instantly provisioned, enables no-downtime maintenance, high availability for hosted virtual machines and enables a utility-computing vision to be realized through dynamic load balancing of virtualized workloads across servers.

Legacy Virtualization: Software Emulation

Today's virtualization products suffer from poor performance and a lack of security and scalability, because they implement virtualization entirely in software. This complex approach involves patching the binary of running guest OSes and emulation of the hardware chipset, to safely share hardware resources between guests.

Currently available products are not able to exploit the features of AMD® SVM Secure Virtual Machine hardware virtualization, which offers CPU and memory virtualization assistance in hardware, eliminating the need for binary patching. AMD has introduced new privileged instructions that allow a modern hypervisor such as Xen™ to achieve bare metal performance for 32 and 64 bit virtualized guests, as well as a built-in I/O virtualization support through an integrated IOMMU. Key to the performance benefits offered by AMD® Virtualization is the introduction to the x86 architecture of a so-called Tagged TLB – hardware assistance to improve hypervisor performance during context switches between hosted guests. AMD® Virtualization also introduces key security elements into the virtualized platform, to meet the trusted-boot



and authentication requirements for secure virtual infrastructure. The growing popularity of Xen is due in part to its ability to exploit these new processor features, and AMD has contributed support for these features into the open source Xen code base.

Xen: Delivers Hardware Virtualization for Bare-metal Performance

The industry needs an affordable, open industry standard virtualization technology designed to take advantage of today's modern virtualization-aware hardware, such as AMD® Virtualization Technology. The Xen open source hypervisor, created and maintained by the founders of XenSource™, pioneered a new virtualization technique that is designed to exploit hardware virtualization, called paravirtualization. Xen paravirtualization unlocks the power of hardware virtualization to run hosted guest virtual servers "on the bare metal" while using AMD's new privileged hardware virtualization instructions to provide direct calls into the hypervisor from virtualization-aware guests to offer overhead-free I/O performance. As a result,

Xen outperforms existing hypervisors while providing guaranteed service levels to each guest OS.

XenEnterprise™: Delivering the Power of Xen to IT Users

XenSource's first commercial product, XenEnterprise, delivers to the market the power of Xen paravirtualization in a fully packaged, enterprise class, easy-to-use software suite. XenEnterprise leverages the acknowledged superiority of the open source Xen virtualization "engine" with enterprise value-added components and built in multi-host management tools to deliver a comprehensive cross-platform virtualization solution that will allow IT managers to safely and efficiently virtualize all server OSes, including Linux, Windows and Solaris. XenEnterprise combines the power of AMD Virtualization, open source Xen, and XenSource's Xen "virtualization stack", to offer the market a truly open, enterprise class virtualization solution that enables virtualization to tackle the most demanding enterprise workloads.

About XenSource, Inc. XenSource, Inc. develops the leading enterprise grade platform virtualization solution, XenEnterprise™, based on the industry's highest-performance virtualization technology, the open source Xen™ hypervisor. Founded and run by the Xen development team, XenSource products allow enterprises to realize the TCO savings that result from server consolidation, increased utilization, and reduced complexity in the datacenter. XenEnterprise will be generally available as a packaged and commercially licensed product in Q3 2006. For more information, visit www.xensource.com



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