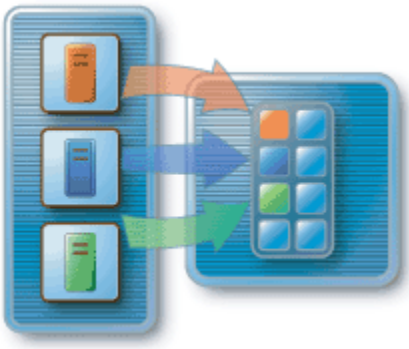
Server Virtualization Software for Your Enterprise Intel Servers

by Tracy Paugh
VMware Inc.

Organizations today are striving to reign in the proliferation of servers, especially Intel-based servers, in their enterprises. Even though Intel servers are generally less expensive (from a pure acquisition cost standpoint) than other alternatives, the cost of managing disparate systems, often existing as "islands of automation," and the applications they host, can be staggering. That is why many companies are considering consolidating their servers, yet they are not exactly sure how to accomplish it without disrupting their operations, nor are they convinced they will achieve the return on investment (ROI) they need to justify it.

Server consolidation can take many forms:

- Centralization - moving distributed servers into centralized data centers
- Data/Storage Consolidation - consolidating data onto large, centralized databases and storage devices
- Physical Consolidation - consolidating servers that run the same operating system and application onto larger systems
- Application Consolidation - consolidating diverse applications and operating systems onto large, partitioned servers or mainframes.



Unquestionably, application consolidation is the most complex consolidation strategy, yet it can yield the most rewarding results. Multiple applications on a single platform raise the possibility of software incompatibilities and resource contention. In addition, most of today's applications are not designed to scale well across more than two or four processors. As reported by the Giga Information Group, "it is very difficult to write code that is efficiently multithreaded to take advantage of more than two to four CPUs, a fact reflected by the diminishing returns seen by many applications as they are run on large SMPs." (Fichera)

Despite these challenges, it is quite possible to realize significant ROI through a well-planned consolidation of applications. The use of an Intel architecture-based solution can add to the benefits by lowering up-front costs, simplifying application migration, and reducing the reliance on proprietary technologies and specialized skill sets. One such solution, the subject of this article, is server virtualization.

What is Server Virtualization?
Server virtualization has actually been around a long time. Mainframe users and administrators have enjoyed the benefits of virtualization for decades. More recently, high-end UNIX servers also employ virtualization capabilities. But what exactly is server virtualization?

Server virtualization involves the transformation of physical systems into a pool of logical computing resources. A single piece of hardware (server) is logically divided (partitioned) into multiple virtual machines so that multiple operating systems and applications may reside in isolation as though they are on their own separate physical machines. Server virtualization also incorporates a sound management system that allows system resources to be dynamically allocated to any operating system based on need, to provide mainframe-class capacity utilization and control of server resources.

Virtualization in the Intel server space is particularly attractive due to the relatively low price point of Intel systems and the ubiquitous nature of Intel-based applications. More and more mission-critical functions are being deployed on Intel servers every day.

However, the overabundance of Intel servers running disparate applications, often as "islands of automation" have resulted in severe management and asset control challenges, not to mention a lack of understanding of the number and cost of servers deployed throughout an enterprise.

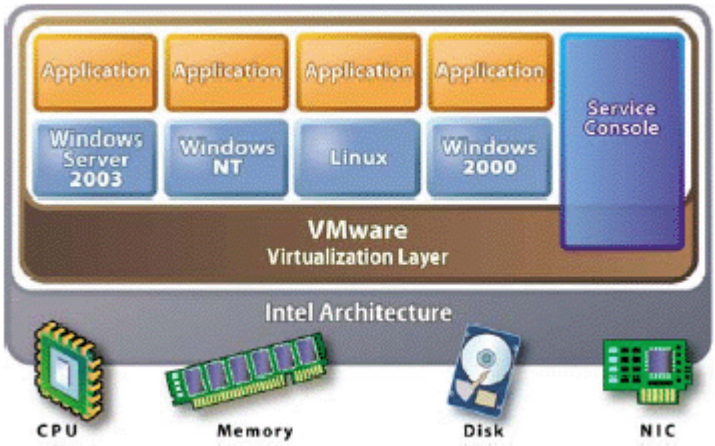
A good server virtualization software solution will enable companies to enjoy a substantially reduced total cost of ownership (TCO), by virtue of the following benefits:

1. Avoiding the costs of unnecessary hardware
2. Providing built-in headroom for expansion and scaling
3. Increasing operational efficiency
4. Consolidating idle resources and re-deploying them on new projects, yield maximum hardware utilization
5. Simplifying systems management
6. Decreasing recovery time on existing non-high availability services
7. Adapting more efficiently to dynamic business requirements
8. Building cost-effective and consistent development and test environments
9. Reducing costs in technical support and training

An example of a server virtualization software solution is ESX Server from VMware. ESX Server simplifies server infrastructure by partitioning and isolating server resources in secure and portable virtual machines. ESX Server enables these server resources to be remotely managed, automatically provisioned, and standardized on a uniform platform. Advanced resource management controls allow IT administrators to guarantee service levels across the enterprise. VMware ESX Server runs directly on the system hardware to provide a secure, uniform platform for deploying, managing, and remotely controlling multiple virtual machines.

More than Just Server Consolidation

Server virtualization software can accomplish more than application or server consolidation. It can help companies solve other business challenges by delivering these added benefits:



- Streamlined testing and deployment - By encapsulating virtual machine images so that they can be easily moved from environment to environment, you can enable more realistic tests in less time with less hardware, achieve shorter deployment cycles and compressed set-up time for complex testing projects, and obtain better project quality, lower project costs, and reduced hardware requirements.

- High availability with guaranteed service levels - By protecting critical data in secure virtual machines and isolating multiple servers that run together at near-native performance levels, you can obtain protection against non-hardware errors, avoid single point of failure for higher availability, run your IT as an enterprise service provider (delivering better service levels to customers), and achieve more control over IT performance metrics.

- Scaling of your hardware and software infrastructure - By running resource-intensive SMP applications such as Oracle 9i, SQL Server, Microsoft Exchange server, SAP, Siebel, Lotus Notes, BEA WebLogic, and Apache in virtual machines, you can increase hardware utilization rates, improve the flexibility and portability of SMP applications, and increase the performance of applications.

A software solution such as VMware ESX Server accomplishes the above, especially in enterprise data centers. ESX Server minimizes the total cost of ownership (TCO) of computing infrastructure by increasing resource utilization, expanding computing capacity, and maximizing server manageability.

Keys to Success

In summary, if you have a variety of Intel servers running a myriad of operating systems and applications, you can regain control of your IT assets and realize substantial savings to your bottom line. The key is determining your business goals (including desired economic savings) and considering whether server virtualization software can achieve those goals (by working with a software provider who listens and understands your business). And then you can be on your way to simplifying your computing infrastructure and expanding your business horizons.

Works Cited

Fichera, Richard. "The Future of the Data Center - Modularity and Virtualization." Giga Information Group, 8 May 2002.

About VMware

VMware is a global leader of virtual machine software for Intel computers, with more than 1 million registered users and more than 5,000 corporate customers in more than 100 countries. VMware was founded in 1998 to bring mainframe-class virtual machines to industry-standard computers. VMware delivered its first product, VMware Workstation, in 1999. VMware entered the server market in 2001 with two products -- VMware GSX Server and VMware ESX Server -- for departmental and enterprise servers. VMware software allows you to run multiple operating systems - Microsoft Windows, Linux, and Novell NetWare - simultaneously on a single computer in secure "virtual machines." Over 80% of Fortune 500 companies are using VMware solutions, including Merrill Lynch, Semantec, Nortel, Sterling Commerce, Ford, Steelcase, and Halliburton Industries. Today, VMware offers these core products: Workstation, GSX Server, and ESX Server, as well as Virtual SMP (multiprocessor support add-on module for ESX Server).
