

SPARC Virtualization: Improving Business Flexibility While Lowering TCO

Introduction:

IT professionals need to provide new IT services but are under pressure to reduce operational and acquisition costs. Businesses need to have the IT flexibility to rapidly add new services but need to do so in a cost-effective manner. Virtualization technologies and services provide a valuable tool for IT professionals to help meet their business requirements. Sun Microsystems recognizes that in today's datacenters, there are many different IT requirements that require a mix of virtualization technologies.

Benefits of virtualization include:

- **Improved system utilization** by enabling the consolidation of many applications on a single server. Virtualization technologies can dramatically improve system utilization, which lowers acquisition, operating, and infrastructure costs.
- **Increased business flexibility** to meet rapidly changing business requirements is a benefit for datacenters that properly deploy virtualization technologies. Businesses need the ability to deploy the necessary computing resources rapidly in support of new applications.
- **Technology modernization** provides numerous business benefits. New hardware provides improved performance and lower operational costs, including power and cooling. Virtualization technologies make technology modernization easier and reduce risk.

While the **cost of virtualization** may determine the extent datacenters adopt these technologies, all of Sun's server virtualization solutions are available to customers at no charge. Unlike IBM and HP, which have various complex licensing schemes, virtualization at Sun is a "no-cost" option.

Improved System Utilization

The traditional way of deploying one application per server leads to low utilization rates, commonly around 10-20%. Consolidating multiple applications onto a server can enable utilization rates as high as 70-90%, which lowers the application's total cost of ownership (TCO). However, running more than one application per server requires technologies that partition server resources to provide the security isolation, resource isolation, and fault isolation that applications require. Partitioning system resources using virtualization technologies lets resources be managed at a much finer level of granularity, thereby improving efficiency and reducing wasted resources. Processors, cores, threads, I/O bandwidth and memory are managed and deployed where, and as needed.

Today's datacenter has many different types of applications with different computing requirements. Some applications require complete isolation because of security requirements or they must be available 24x7x365. Some applications require specific OS versions. Some are "well-behaved" while others grab all available resources. Sun has created a portfolio of server virtualization technologies because one size does not fill all requirements. Sun has three virtualization solutions for SPARC® products:

- *Dynamic Domains* is a hardware partitioning technology available on Sun's M-series servers
- *Logical Domains (Ldoms)* (note...is the abbreviation "Ldoms" or "Ldoms" or LDOMS or LDOMs? does not matter to me but we should be consistent to other Sun usage...what I saw on the virtualization website was "LDoms") is a hypervisor-based partitioning technology available on Sun's CMT servers
- *Solaris Containers* is a software virtualization solution that is available on any server that runs Solaris, whether SPARC® or x86-based

IBM, on the other hand, believes in a "one size fits all" approach to server virtualization. They try and make the data applications fit their technology instead of matching the best solution for the customer requirements. HP has the opposite approach in that they offer a confusing variety of similar virtualization technologies making it difficult to figure out what is best for the customer requirements. However, if the virtualization solution is not a good fit for the customer application, IBM has expensive services to try to force the round peg into the square hole and HP will provide services to figure out what virtualization technology should be deployed. Sun provides a balance between the "one size fits all" approach and offering too many similar options. Sun offers a variety of

virtualization solutions that can meet any application requirement and there is no charge for any of Sun's virtualization offerings. If a customer decides to change from one Sun virtualization solution to the next, there is no cost to move. The IT manager can make a decision on the best virtualization solution based on business requirements instead of solution costs.

Increased Business Flexibility

Datacenter managers need the flexibility to meet changing business requirements by changing the resources available to existing applications and being able to quickly deploy new applications. Virtualization solutions allow a server to be viewed as a pool of resources that can be used where needed. Useful virtualization solutions need to have the flexibility to change the number and size of partitions rapidly and dynamically. Efficient virtualization means that new compute requirements can be met by modifying the virtual machines in a server instead of the costly and time-consuming process of adding a new server.

Datacenter managers using Sun's virtualization solutions need not worry about increased costs when creating new partitions or whether or not they need an expensive consulting engagement to change their virtual environment. Sun's virtualization solutions are no-cost and can be modified at any time; new partitions can be created as needed and existing ones modified in size without the need to reboot the server. And, unlike IBM and HP, adding new partitions does not increase license costs. The more virtualization is used on IBM and HP systems, the more expensive it becomes – expensive enough that it may even negate the costs savings in improved system utilization. Furthermore, datacenter managers can completely reconfigure the hardware resources of a dynamic domain with no disruption to any other dynamic domain on the same server. IBM and HP customers must bring down all partitions when performing hardware maintenance or reconfiguration.

Technology Modernization

Today's server technology provides better performance, price/performance, reliability, availability, serviceability (RAS), manageability, and virtualization capabilities. These servers provide more capability using less power, as well as reducing service and maintenance costs. Lastly, newer servers are sometimes necessary to comply with various governmental or environmental standards.

Datacenters that can take advantage of these newer, more efficient servers can lower their IT costs and gain a competitive advantage. However, to take advantage of newer servers, it is necessary to be able to deploy legacy applications. The benefits of technology modernization are increased if it is possible to consolidate legacy applications and deploy newer applications on the same servers. Sun virtualization solutions, such as Solaris 8 and Solaris 9 Containers, make it possible to consolidate and run older applications on newer Solaris 10-based servers and take advantage of the improved hardware. In contrast, some of IBM's newest virtualization technologies are only available for applications that are supported on the newest version of AIX (6.1). IBM customers that have applications that need to run on older versions of AIX cannot use the newest IBM virtualization technologies nor the latest hardware from IBM. Sun's longstanding Solaris binary compatibility guarantee, combined with Solaris 8 and Solaris 9 Containers, means that customers who have applications that were deployed years ago can use the latest SPARC/Solaris servers. Like all other Sun virtualization solutions, Solaris 8 and Solaris 9 Containers are available at no charge to customers.

Summary

Datacenters need to reduce IT costs but still support rapidly changing business requirements. Virtualization solutions can help IT professionals take advantage of the latest hardware and improve the utilization of existing hardware, which leads to lower datacenter costs. Costs can be lowered for acquisition, operations, infrastructure and service. Virtualization solutions can also provide greater flexibility to meet changing business requirements.

Sun provides a portfolio of SPARC/Solaris virtualization solutions to meet the differences in application workloads and business requirements. In contrast, IBM offers a limited “one size fits all” approach, and HP offers a confusing array of technologies. And both vendors charge to deploy their virtualization solutions. All of Sun's virtualization solutions are free and flexible, which means that IT managers have the flexibility of redesigning their virtualization environment – with no extra cost or increased complexity. For more information on Sun's server virtualization solutions please go to: www.sun.com/servervirtualization