

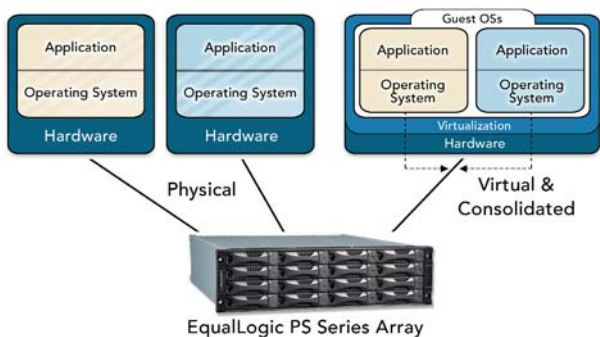


VIRTUAL SERVERS NEED VIRTUAL STORAGE

SANs provide transparent movement of applications across your enterprise without the hassles of reinstallation, copying, or reconfiguration, resulting in flexibility, improved resource utilization, and lower costs.

Consolidation is a common trend in many IT environments, providing benefits such as improved hardware resource utilization, easier management, and lower costs. For storage, consolidation is accomplished by moving data off of direct attached storage (DAS) inside the server onto a shared pool of storage in a storage area network (SAN). Recently, server consolidation has become popular thanks to technologies like Microsoft® Virtual Server 2005 and VMware® products ESX Server™ and VMware Server™. These “virtual machine” resources enable you to consolidate server images on fewer hardware platforms to improve IT efficiency.

Physical and Virtual Systems on a SAN



MAKING THE BEST OF A COMPLEX SITUATION

It's easy to see the advantage of consolidating servers. In today's IT environment, you're likely to run numerous applications on many operating systems (OSs) – and until recently, the easiest way was to run each application on different server hardware. The drawback was low server utilization rates. If each physical server is responsible for its own application, server utilization rates often run about 30% – leaving 70% of the server unused. If you have 100 servers at 30% utilization, you could improve utilization by removing 50 applications from their own servers and placing them on top of the other 50 servers, giving you 60% utilization. CIOs and business managers wonder why they have to buy and operate so many servers when there's plenty of unused capacity already deployed. Fewer physical machines would reduce both capital expense and staffing costs.

There are good reasons behind IT's deployment methods. Because expansion of server resources for a deployed application is painful, time consuming, and requires downtime, it is often easier to use individual servers for new applications than to try to configure servers with multiple applications to effectively use capacity, and then have to deal with workload changes that cause later re-deployment. Low utilization rates meant at least you had a place for the application to grow easily and avoid additional IT burden and application downtime. It might not be what you really wanted, but it was the best choice at the time.

VIRTUAL SERVERS – AT LAST, PORTABILITY

With virtual server technologies, encapsulation and movement of both operating environments and applications is easy. Now you can consolidate servers and gain flexibility rather than IT headaches. Operating system images and applications are now portable

between physical machines rather than wedded to hardware, yet each virtual server maintains its identity to clients. By virtualizing server hardware, network configurations, OS, and application configurations, this technology allows transparent movement. With Microsoft Virtual Server 2005 or VMware, you can run multiple OSs and applications as smaller units that are encapsulated. It's as if you have a "handle" to pick up an OS and application and move it to another server hardware system with minimum disruption. Now, moving a virtual machine is simple:

1. In a SAN environment: Copy a configuration file, pause the application, and resume on different hardware.
2. In a DAS environment, it takes more work: Stop the application, execute a lengthy data copy process, and restart.

VIRTUAL SERVERS AND VIRTUAL STORAGE

This flexibility to move applications between servers does introduce some new challenges. Moving virtual servers between physical machines places extra burdens on storage – now storage traffic loads vary as multiple virtual and physical machines try to access data. If your servers are virtual but your storage is still physically attached to the hardware (as in a DAS environment), you haven't improved much, because while you can move the OS and application, you still have to copy the data.

Guard against implementing a solution that only solves half the problem – if you consolidate servers and storage, ensure that best-practice storage management is available to both your physical and virtual servers.

SAN environments add flexibility and eliminate most data copying, but administrators still have to deal with storage load balancing and scaling tasks – which still require downtime. To provide the most flexible and fluid implementation, virtual servers need virtual SAN storage with automatic load balancing.

SELECTING VIRTUALIZATION TECHNOLOGIES

Since virtual server and SAN technologies vary, be sure to select the solution that offers all the functionality you need. For example, it's important that the virtual machines be "SAN aware" – if the virtual machines "know" they are on the SAN, then SAN-based functions such as snapshot-based backups, Multi-Path I/O, cluster support, and SAN booting will be available. If not, the virtual machines will "believe" they are on DAS, and many of the advanced server and SAN features will be unavailable. You'll have improved portability only to give up storage management functionality. This also ensures that regardless of server deployment (physical or virtual), application environments are consistent and efficient. Only end-to-end portability with these advanced data services delivers improvement throughout your infrastructure.

The best SAN technology for enabling virtual machines to be on a SAN and be "SAN aware" is iSCSI. Deploying virtual servers with intelligent, virtual iSCSI SAN storage gives you tremendous flexibility and reduces management tasks. A solution using EqualLogic PS Series iSCSI arrays allows you to move applications and OSs easily. In addition, the self-managing storage automatically load balances and scales for optimal performance.

SIMPLIFYING NETWORKED STORAGE

EqualLogic PS Series solutions deliver the benefits of storage consolidation in an intelligent, enterprise-class storage system that is easy to install, manage and grow. Let us show you what simplifying networked storage can mean for your business, visit our web site at www.equallogic.com.

Checklist for Virtual Server/Virtual Storage Solution
Does your solution support SAN configurations, for "guest" machines as well as traditional servers?
Does your SAN automatically load balance data and scale, or are those manual tasks?
Can virtual machines and guest OSs use SAN functions such as snapshots-based backup, disaster replication, MPIO, clusters, and boot from SAN in the same manner as physical servers?



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