



Richard Villars

Vice President, Storage Systems and Executive Strategies

Dynamic IT: The Impact of Virtualization

December 2010

Server virtualization has played a prominent role in the growing desire among organizations to transform the entire IT environment. As enterprises extend and rationalize their virtualized environments, they want to use existing assets more efficiently; deploy new datacenter assets in smaller, timelier increments; and reduce the operational costs of administering those more dynamic assets. Along with virtualization's benefits, however, come challenges to the IT department in terms of technology, management, and organizational issues.

The following questions were posed by Hitachi Data Systems to Richard Villars, vice president of IDC's Storage Systems and Executive Strategies, on behalf of Hitachi Data Systems' customers.

Q. What is virtualization doing to IT?

A. The adoption of virtualization was a multiyear process that really got started with server virtualization. Depending on the organization, server virtualization took root anytime from five years ago to last year. For many organizations at the start, server virtualization was done in small, isolated increments. As organizations began to consolidate and scale virtualization deployments — going from 10 servers, to 100 servers, to thousands of servers for larger organizations — the impact on IT became evident on a number of levels.

From a purely functional level, virtualization is often very disruptive to existing IT assets, especially existing SAN environments. As organizations scale virtualization, that tends to create even more pressure on the existing storage environment. An organization with a SAN in place may very well find it necessary to reconfigure the storage network because of different traffic loads. The storage systems begin to get out of balance. An organization may also have to change its network models because virtualization can affect the load on systems overall.

Where virtualization has the biggest impact, however, is with the IT people and the IT organization. In one way, server virtualization was great because it made IT staff into heroes. IT could deliver significant cost reductions and improvements in response times for server assets. Yet server virtualization also drove senior management to ask why similar benefits couldn't be achieved every place throughout the IT organization. Why can't IT improve storage utilization levels? Why can't IT reduce the cost of the network infrastructure? Why can't IT reduce the response time issues associated with backing up and recovering data?

In many ways, the biggest impact of virtualization on IT organizations is that it changed expectations, whether regarding the cost of deploying the new servers, recovering an application, or developing a new application. Due to the success of server virtualization, IT has to take virtualization to the next level. Virtualization is no longer a point solution: It's the foundation for changing how IT teams run the datacenter.

Q. Is virtualization helping or hindering IT?

A. With any technology, there are positives and negatives for IT. Virtualization has helped many IT organizations have an immediate impact and become heroes, at least for a short period. In the longer term, virtualization is helping IT organizations by exposing the manual, repetitive tasks inherent in many IT processes related to storage, networking, and servers that people had to do every day just to keep things running. Virtualization in effect has shown that IT doesn't have to be run that way. There are ways to automate mundane processes with the right technologies. For example, by leveraging storage virtualization, IT doesn't have to constantly provision storage resources every time someone launches a new server or changes backup processes.

Virtualization is seen as very positive in the big picture. However, as IT departments deploy virtualization, they do expose some process shortcomings. When going to virtualization, IT can change backup processes from daily to every four hours, for example. Then IT needs to look at whether the storage system has intelligent replication services or data deduplication capability so that the new backup process doesn't become a huge consumer of storage capacity. One enhancement can quickly lead to a new problem.

Overall, though, virtualization is a help in that it is going to make it possible for IT organizations to respond much more quickly. Yet there is also no question that virtualization is disruptive to a lot of existing business practices, budget processes, and the like, and IT organizations have to make adjustments.

Q. What should organizations think about as they consider and plan for the next wave of virtualization?

A. One of the first areas to think about is storage. Many IT departments assume that if they have a network storage system in place or a SAN, the excess capacity can be allotted to the virtual servers. If that is the strategy, IT will have to look for warning signs; all of a sudden, small applications that weren't seen as a big consumer of storage resources will take up all that excess capacity as virtual machines are added. Then IT is faced with a migration or an upgrade that wasn't in the plans or budget. It's very important when IT considers virtualization to think about the ongoing consequences of adding more applications because virtual server environments are very dynamic. In some ways, it's so easy to spin up new apps that people do simply because they can — and that can overwhelm the storage system.

Another thing to pay attention to as organizations go to scale — as they start thinking about deploying 500 or thousands of virtual machines in multiple datacenters — is the operation of the storage assets themselves. Companies must deploy virtualized storage solutions that provide deep scaling for storage asset utilization and data management. In large virtualized environments, technologies like thin provisioning and automated data tiering are a critical foundation for managing all the information without breaking the bank or the IT staff.

A good example of the critical nature of storage virtualization is that it can ensure that the recovery/backup processes at the server level and at the storage level are well coordinated. One of the benefits that IT derives from server virtualization is the whole idea of live application migration from one server asset to another for availability or load balancing purposes. Yet if IT doesn't also migrate the data, or if the links between where the data is located and where that application is located don't move as well, IT is going to run into challenges.

The following is a typical indication of a problem: There is a lot of sudden pressure to change data security practices, and there are concerns about how to protect the assets from different applications. The SAN link to the storage is suddenly being overloaded — there were normal expectations of growth and demand and all of a sudden there will be spikes in demand. The spikes may not last for long, which usually indicates that IT is implementing a more dynamic virtualized environment and trying to link into systems to see how they're going to behave. As a result, organizations should look for storage platforms that can support a more dynamic approach.

Q. What can organizations do to be better prepared?

- A. In terms of planning, organizations have to do more than just evaluate a product by speeds and feeds, how fast it is, and how many cores it has or how many disks it supports. IT has to look more at the data management and the automated configuration functions of the system. When IT makes a transition to virtualization, much more planning has to take place at the level of what acceptable recovery times are for applications. That will then provide IT with some guidance about how frequently IT will need to back up or replicate data or when to reposition data on a new storage platform.

It's really about moving away from bits and bytes and reconfiguration kinds of issues to thinking about setting expectations of quality of service for a particular storage asset. That quality of service would include performance response time and the cost per gig of storing longer-term archive data. The time IT needs to provision new capacity and expand the storage resource is also a quality-of-service issue as is time to recovery. In addition, IT has to consider and plan accordingly whether to bring an application back up in a different system or a different location.

Q. What are the strategies for success?

- A. IT really has to change its view of the services it offers. When deploying virtualization, IT is not just buying the server, the storage, or a network device. IT is buying a unit of IT that can be provisioned for database applications, collaboration applications, or analytics business decision support applications. When looking at the underlying technologies in this context, IT has to make sure the technologies fit within that converged IT view and that the solutions enable the delivery of services in a more automated way so that IT doesn't have to constantly tweak a server or reallocate capacity in a storage device.

When considering a storage solution that is virtualized, the solution should include virtual volumes, thin provisioning, and automated data tuning so that everything is not on the most expensive storage out there. Virtualizing the storage is really the first move to think about in terms of moving to a dynamic IT model.

Another layer is to understand that the storage system is really the foundation for data management. So when IT wants to enable datacenter-to-datacenter recovery in a virtualized environment, the abilities of the storage systems and the data replication services and the data repositioning services that are on those platforms are really the foundation for making everything work because if the data is not at the other datacenter, it doesn't matter if all the virtual machines are there. IT has to extend the view beyond a single system to multiple systems in and across the whole datacenter that are doing different jobs (backup, active data, archiving) and then extend that to the next level of doing data management between datacenters.

It's important to understand that that system has to scale up dynamically and scale up in terms of performance. The system needs to scale out when adding more resources and more

applications that should then be managed in a common way. Finally, the system needs to scale across the wide area. In effect, the system needs to scale to the entire enterprise and not to just individual datacenters. IT organizations should be looking at a storage and data management solution to complement virtual servers or to integrate a converged server platform.

ABOUT THIS ANALYST

As vice president of Storage Systems and Executive Strategies, Richard Villars is a senior member of IDC's Information Infrastructure research team, which assesses the development and adoption of storage solutions for rapidly growing information assets. He develops IDC's viewpoints on the evolution of storage networking infrastructure and next-generation storage technologies. He advises clients on the impact of tiered storage, bladed servers, virtualization, and regulatory compliance on organizations' storage and information management practices.

ABOUT THIS PUBLICATION

This publication was produced by IDC Go-to-Market Services. The opinion, analysis, and research results presented herein are drawn from more detailed research and analysis independently conducted and published by IDC, unless specific vendor sponsorship is noted. IDC Go-to-Market Services makes IDC content available in a wide range of formats for distribution by various companies. A license to distribute IDC content does not imply endorsement of or opinion about the licensee.

COPYRIGHT AND RESTRICTIONS

Any IDC information or reference to IDC that is to be used in advertising, press releases, or promotional materials requires prior written approval from IDC. For permission requests, contact the GMS information line at 508-988-7610 or gms@idc.com. Translation and/or localization of this document requires an additional license from IDC. For more information on IDC, visit www.idc.com. For more information on IDC GMS, visit www.idc.com/gms.

Global Headquarters: 5 Speen Street Framingham, MA 01701 USA P.508.872.8200 F.508.935.4015 www.idc.com