



**Benjamin S. Woo**

*Program Vice President, Worldwide Storage Systems*

## **IT Efficiency: Shades of Green**

*December 2010*

*In today's cost-constrained business environment, organizations are looking to deploy green IT solutions that can enable their datacenters to operate more efficiently and reduce operating expenses yet still handle increasing demand for computing resources. By deploying various technologies such as virtualization throughout the datacenter, organizations can reduce their consumption of energy, thereby becoming more green.*

The following questions were posed by Hitachi Data Systems to Benjamin S. Woo, program vice president of IDC's Worldwide Storage Systems, on behalf of Hitachi Data Systems' customers.

**Q.     What are the focus areas of storage efficiency improvements that can have a positive impact in the datacenter?**

A.     There are a number of broad areas of efficiency in the datacenter: virtualization, tiered storage architectures, capacity efficiency, as well as power and cooling efficiency.

Virtualization is arguably the most effective way of creating efficiency in the datacenter. The combination of server, storage, and network virtualization allows end users to minimize capital expenditures while maximizing utilization.

Tiered storage architectures take this to the next level. Tiering enables end users to allocate and provision the most appropriate storage media to various service levels. This too will lead to minimizing capital investments and maximizing performance.

In terms of capacity, the three most prominent technologies that can drive capacity efficiency are thin provisioning, deduplication, and compression. Thin provisioning allows customers to provision or provide capacity to end-user applications but allows those applications to use only a subset of that capacity. Often, application users and developers want to preallocate some space. They think that they will have a database that's going to be 100 gigabytes large. But in reality, what they use is some subset of that. Maybe it starts out being only 2 terabytes or 10 gigabytes. In effect, thin provisioning allows the storage administrator to tell the application people that 100 gigabytes exist without actually having to consume all of that space. Deduplication essentially involves looking at data and minimizing the amount of data that has more than one instance or copy. Compression looks at the data and tries to take out all the unnecessary bits so that any file or any object is compressed down to its bare minimum. By consuming only the capacity needed, the excess capacity — 90% in this example — is not sitting idle doing nothing. This helps datacenters in two ways: the efficiency of the actual capacity (datacenters are buying only the amount of capacity that they are using) and cost savings (there is now no point in buying 10 times more capacity than you are actually using).

To achieve power and cooling efficiencies, there are two main approaches. By using smaller form factor disk drives such as 2.5in. disk drives, the amount of floor space required can be minimized and in turn consume less power. Also, the use of solid state drives reduces energy consumption because these drives don't have moving parts and require less power.

**Q. How does management help?**

A. From a management perspective, being able to integrate storage systems and datacenter management systems together can enable efficiency. For example, having a single platform in which storage management is integrated into an overall systems management design and especially into the virtualized server management can lead to personnel efficiencies in that fewer people can accomplish more tasks. Datacenters can operate effectively with fewer people, which of course has benefits in terms of efficiency, but this also allows datacenters to create processes and workflows in order to automate the provisions of storage. Everything works efficiently and is very repeatable, leading to predictable operations.

**Q. How much can be saved in operations and capital?**

A. Utilization rates for storage vary greatly but typically are not as high as many would desire. Therefore, in many cases, the use of virtualization, storage tiering, thin provisioning, deduplication, and compression can save organizations at least 50% of the cost of storage capacity especially. This certainly makes a big dent in the capital investment on a year-over-year basis. On an operational basis, the fact that organizations can share workload among virtualization, storage, and system administrators obviously can result in a big savings. From a power and cooling perspective, using 2.5in. drives can result in organizations being able to squeeze twice as many disk drives in the same space. Organizations could be saving 50% in power use and real estate costs just by moving to that type of technology. With solid state drives, even greater savings can be achieved.

**Q. What can organizations do now in terms of implementing efficiency initiatives?**

A. Organizations that haven't done so already should look to virtualizing their storage and servers and deploy thin provisioning to address the issues related to capital outlays and maximizing utilization. Then organizations should look at deploying capacity efficiency technologies such as deduplication and compression. In addition, management software that provides management of the storage itself as well as a way for administrators to help instrument the effectiveness of efficiency initiatives should also be evaluated. Finally, organizations should look to implement solid state technology wherever possible. It's important to go beyond just using solid state disks because solid state storage technologies can help with power, efficiency, and performance improvements.

**Q. How can organizations achieve greater efficiencies while protecting their current investments?**

A. Organizations should look to deploy next-generation storage systems that can virtualize existing and current investments, thereby protecting those investments moving forward. In protecting their investments, they can affect two things: They can ensure a much more solid migration toward newer, more efficient technologies, and they can also gradually evolve the management and capacity practices that they have today to work in conjunction with a newer system. It really is not about a rip-and-replace strategy; organizations have to deploy efficiency technologies and evolve their management practices over time.

## ABOUT THIS ANALYST

*Benjamin S. Woo, program vice president of IDC's Worldwide Storage Systems research, leads a team of analysts responsible for advising clients on the evolution and trends related to data storage systems; the impact storage systems have on adjacent technologies, including servers, software, cloud, and virtualization; and best practices in go-to-market strategies related to the storage industry.*

---

## 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](mailto: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](http://www.idc.com). For more information on IDC GMS, visit [www.idc.com/gms](http://www.idc.com/gms).

Global Headquarters: 5 Speen Street Framingham, MA 01701 USA P.508.872.8200 F.508.935.4015 [www.idc.com](http://www.idc.com)