Five Cost-effective Steps to Building a More Eco-friendly Data Center

Building a More Environmentally Friendly Data Center: Time for a New Approach

Concerns over global warming, energy conservation, and social responsibility are leading to an unprecedented amount of media coverage about all things "Green." Not only is there increased press coverage, but environmental protection issues are also gaining much more visibility with data center managers.

Global energy concerns and the debate on global warming are at the heart of the matter. At an operational level, many disparate forces are driving decisions regarding to what extent existing data centers can cope with additional equipment and where new ones are located. Companies are choosing to build data centers away from their center of operations just to be near adequate and reliable sources of electricity.

Power consumption, cooling costs, and space requirements are not the only issues. Enterprises are requiring storage solutions that:

- Have lower power consumption and heat output
- Can be configured to further reduce cooling requirements in data centers

- Meet environmental directives regarding construction and recycling
- Are manufactured by suppliers who have a green supply chain
- Come from socially responsible suppliers

Various estimates show that storage accounts for 30 percent to 40 percent of the power used in data centers. In fact, IDC estimates that storage accounts for 37 percent of overall data center power consumption. This is compounded by the fact that virtually all organizations continue to generate and handle increasing amounts of data that is critical to their business. IDC estimates that this data is growing at a compound annual growth rate (CAGR) of 52 percent. With energy costs rising and the potential for energy surcharges, this issue is rapidly becoming a top business concern.

Governments, particularly in the European community, are increasingly concerning themselves with levels of carbon emissions, rising energy costs, and the potential for energy surcharges. In the United States,

Public Law 109-431 is now effective. Its goal: "to study and promote the use of energy-efficient computer servers in the United States." The law reflects growing environmental concerns and states that "it is the in the best interest of the United States for purchasers of computer servers to give high priority to energy efficiency as a factor in determining best value and performance for purchases of computer servers."

If major enterprises and larger midsized organizations are to cope with rapidly increasing amounts of data, they need to rethink the approach to building more environmentally friendly data center facilities. What is needed is a cost-effective, eco-friendly, and socially responsible approach to managing the explosive growth of data.

The Environmental Problem

When it comes to accommodating the rapid growth of management, storage, and archiving of data, environmental issues are now everyone's concern as

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organizations of all sizes struggle to keep pace in matching their storage needs with business requirements.

Reduce Data Center Hot Spots

Data centers have grown without sufficient thought to future power and cooling requirements. Once a storage rack is placed on the data center floor it is difficult to move without causing disruption to applications. Items to consider include:

- Storage and server racks should be configured with cold rows and hot rows. Otherwise, the back row is breathing the exhaust from the adjacent front row. Without virtualization, data center managers would be stuck with that configuration and probably have to provide more cooling.

- Virtualization capabilities should be used as they enable data center managers to reconfigure the storage racks without disruption and to take advantage of more balanced cooling configurations.

Implement Virtualization Strategies

Many data center floors and storage implementations have been configured without adequate consideration to heat distribution. Once equipment has been put in place, relief of data center hot spots without disrupting applications can be difficult. Items to consider include:

- Virtualization can help to reposition hot spots without disrupting the applications, but use of multiple controllers will consume additional power and require more cooling and space for the controllers. It may also create additional hot spot problems.

- The amount of data storage that can be managed by a single controller needs to be carefully evaluated to account for present and future growth requirements.

- Cost-effective virtualization strategies need to embrace as much storage as possible so that utilization is optimized, saving power and cooling.

- Virtualization must be easy to manage through one common user interface, technology, and application; easier management saves on human resources.

Consolidate Storage

Disparate storage is inefficient because assets are typically underutilized, wasting capital investment in storage infrastructure, and, from an environmental perspective, unnecessarily consuming power, cooling, and space resources. Items to consider include:

- Organizations should carefully evaluate their future data storage capacity and performance needs. This will help ensure that they don't outgrow capacity or hit other system limitations, which would impact the capital cost or environmental savings model.

- In addition to lowering the total cost of ownership and improving productivity, properly implemented storage consolidation can reduce management complexity by lowering the number of storage devices, centralizing administration and policies, and enhancing security and control.

- The emergence of high-performance network attached storage (NAS) systems that can be clustered together and have sophisticated built-in virtualization systems can significantly change user cost dynamics. Centralized NAS can help drive down costs of power, cooling, and data center floor space.

Deploy Services to Help Design the Right Infrastructure

The demand for data center services is growing rapidly and attracting new entrants.

Established service vendors and small niche consultancies are competing to provide the complete range of services. These range from new data center architecture designs to refurbishment of established sites. Items to consider include:

- Buyers should look to vendors to offer professional services that will help them design the most appropriate storage architectures and avoid overbuilding capacity, which leads to higher environmental and capital costs.

- Data center managers should ensure that vendors offer professional services for virtualization techniques, which lead to improved power efficiency and more economic cooling systems.

- Organizations need to consider the increasing costs of disposal of old or returned equipment, which are now becoming a significant factor. They need to easily access resources to ensure that returned or end-of-life equipment is either recycled or disposed of according to environmental directives such as Waste Electrical and Electronic Equipment (WEEE) and Recycling of Hazardous Substances (RoHS).

Investigate the Vendor's Environmental Track Record

Marketing to current popular green themes is only a small measure of the commitment to environmental issues. It is necessary to dig deeper to understand whether environmental

issues and sustainability really are part of the DNA of a storage vendor. Items to consider include:

- How much control does the vendor have over the total supply chain? Does the manufacturer have an accreditation process for continuous improvement towards a declared corporate mandate for measuring environmental activities?

- Does the storage vendor have a clearly defined road map and standardized management processes to minimize the impact on the environment and to comply with applicable laws?

- What is the supplier's history and track record on social responsibility? Has it won any environmental awards?

The Hitachi Data Systems Advantage

Hitachi Data Systems can look at environments in a way that competitors cannot because of its unique ability to segregate the controller from the storage media. As one leading analyst reports: "Competitors are stuck looking at environments with the spinners glued on."

Data Center Hot Spots

Only Hitachi Data Systems offers controller-based virtualization, which separates the controller from the storage media—in any environment. Other vendors are limited to supporting only their storage in their cabinet.

Virtualization Strategies

The Hitachi Universal Storage Platform™ V is competitively superior for implementing green data center policies. In addition to the unique and powerful controller-based engine, which is separate from the storage media, it can manage up to 247 petabytes (PB) across data center assets with a single controller. Compare this capability with alternative market offerings: some support only 0.5PB with a single controller and others support only 1.2PB with a single controller.

Hitachi virtual storage controllers can manage this considerable amount of storage behind a single storage controller with the equivalent

number of processors as alternative market offerings, but supporting much more storage capacity per processor than these alternatives. As a result, the Universal Storage Platform V brings material power, cooling, and space advantages to organizations.

It is estimated that Hitachi Data Systems virtualization and logical partitioning can help reduce energy and cooling costs by between 30 percent and 50 percent.
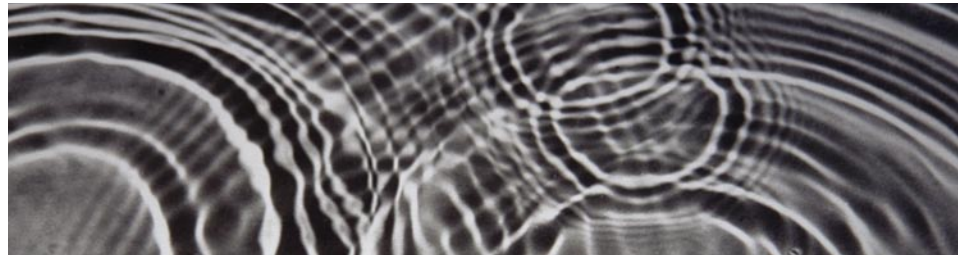
Consolidation Considerations

Hitachi Storage Management Suite software enables a robust consolidation platform with industry-leading multidimensional virtualization, reliability, and stability. Consolidation and virtualization help reduce energy, cooling, and real estate requirements. Hitachi Storage Management Suite software includes a number of modules to help implement more efficient storage consolidation and virtualization strategies.

In enterprise consolidation applications, the Hitachi High-performance NAS Platform, powered by BlueArc®, uses only one-third to two-thirds of the energy of competitive offerings, saving significant amounts of environmental resources and costs.

Services to Help Design the Right Infrastructure

The Storage Economics Strategy Service from Hitachi Data Systems offers a component that focuses on the environmental costs of storage technology. This and virtualization technique services lead to improved power efficiency, more economic cooling systems, and reduced real estate requirements.

Environmental Track Record

Hitachi Data Systems has a long history and proven track record of supplying environmentally friendly storage solutions. The company voluntarily set an early date to be

compliant with the environmental directives for RoHS and WEEE. Hitachi was one of the early manufacturers to prevent rather than dispose of hazardous wastes.

Hitachi, Ltd., and its subsidiaries have a long history of environment-related activities and awards stretching back over 30 years. For example, between 2000 and 2005, projects undertaken by Hitachi ESCO (Energy Service Company), in which the

cost of investing in energy-saving technology is covered by the energy reductions achieved, have achieved an aggregate reduction of approximately 120,000 tons per year of CO_2 emissions.

Hitachi Data Systems is a partner of choice for implementing environmentally efficient IT solutions and is fully committed to helping its customers:

- Implement more environmentally friendly data centers—through technologies and services

- Reduce their data center power, cooling, and facilities costs

- Comply with environmental directives

The Hitachi Data Systems three-fold strategy for achieving these goals is: designing, manufacturing, and supporting environmentally friendly storage infrastructures throughout their entire life cycle—including end-of-life disposal.

Hitachi Data Systems: Creating a Better World through Corporate Social Responsibility

Find out more at: www.hds.com/green

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