Whitepaper

Green IT:
Energy Efficient Data Backup

Immediate actions and long term strategy
for improved energy efficiency

NOVASTOR
Backup & Restore

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Introduction

In a recent study for the New York Times, Jonatahan G. Koomey, Ph. D., noted that US and world data center electricity usage grew by approximately 36% and 56%, respectively, from 2005 to 2010, totaling approximately 1.3% of World electricity use and 2% of total US electricity use in 2010.

Within corporations, awareness is developing around the growing power requirements of IT. While few IT managers know the actual energy costs or usage totals of their department in kWh, most managers have a relatively good sense of the massive increase in electricity cost.

For a long time now the discussion on Green IT has been primarily focused on the procurement of energy efficient hardware, which certainly has a direct impact on energy usage. However there are many other relevant adaptations to consider for improved energy efficiency.

Green IT and Energy Efficiency: What's at stake

The concept of Green IT is to design information and telecommunications technologies to be eco-friendly. This includes elements of design, production and operation. Apart from the manufacturing process and disposal considerations, Green IT focuses on CO_2 emissions and power consumption.

While Green IT initially referred to the replacement of old equipment with a newer "green" generation of hardware in the data center, the subject has increasingly broadened. The Data Center Infrastructure Efficiency (DCiE) value illustrates this . The DCiE is the recommended method to assess energy consumption and to evaluate the success of efficiency measures. To calculate DCiE, the energy consumption of IT hardware needs to be divided by the total electricity consumption per infrastructure component (cooling, USV, etc.)

Cutting Costs with Existing Hardware

One of the ways to reduce energy consumption in data centers, for example, is the streamlining of data center devices into cold and hot aisles and adjusting the corresponding airflow, which rewards companies with a reduction in the cost of heating and cooling within the data center.

Another very popular approach is to optimize server utilization through virtualization. If just a single application is running on a server, the processor is rarely utilized to more than 15%. In fact many computers use less than 5% of their CPU a majority of the time.

Using virtualization technology, multiple server operating systems run in parallel, each running their own applications, but only utilizing a single set of hardware. This reduction in hardware requirements due to server consolidation and virtualization is

an effective means of reducing energy consumption. Another lesser known, but equally powerful method of conservation is the energy-efficient back up of data. It achieves both short-and long-term savings in energy consumption.

Immediate Action: Backup Recommendations for Energy Conservation

Among the immediate measures to reduce energy consumption is the limitation of space used by private data and the exception of private data from the backup. With this in mind, the first step is the creation of a policy that stores private data in appropriate folders. Subsequently, IT administrators may disregard or remove specific data through a simple adjustment of the backup software. On the list of long-term recommendations to consider is the use of alternative storage media.

Long-Term Measures: Use of Efficient Storage Media for Data Backup

The larger the memory storage footprint of a company, the greater the cost of creating a backup to disk. As mentioned earlier hardware consumes power, but so too does cooling and protection. Currently, a medium sized company with 30 servers needs to invest roughly $750 USD for the cooling of a server room.

Today companies are employing multi-tiered security strategy to combine high data availability with energy-efficient technologies. A central concept here is the storage of selected data backups on energy-saving technologies such as magnetic tape. Selection criteria may be based on storage period (For example: backups that are older than two weeks) or backups of certain divisions.

With the transition from disk to tape libraries as backup media for less frequently used data, energy consumption is additionally reduced. A tape library of course consumes power too, but requires much less in the way of cooling. Individual tapes only consume power when they are in use. Their storage, whether in the tape library or at another location - is offline, meaning energy-neutral.

Be Prepared

If you want to use magnetic tape as a backup medium, you must also determine if the backup software suitably supports this technology. The purchase of the appropriate backup software with tape library support for energy savings could potentially pay for itself within the first year. For companies to take full advantage of magnetic tape, backup software should not only support tapes as a backup medium, but also manage multiple sites and manage the removal of the tapes from the tape library. The management of media storage at different locations is required to ensure that backups remain accessible and are readily available for a restore. Only if you know where the tape is located at all times, will data availability remain guaranteed. Restore requirements (recovery time objectives, recovery point objectives) are recommended as selection criteria for storing selected tapes offsite..

The Effort is Worth While

Data center operators, but also medium-sized enterprises that are growing, can optimize their energy consumption in many ways. As an immediate measure, private data is carefully managed and excluded from standard backup. In the long term, energy- and cost savings require the inclusion and professional management of energy-efficient storage devices into the backup strategy. Given high and rising electricity prices and increasing volumes of data, consolidation of machines through virtualization and a backup solution to support these efforts effectively is critical.

About NovaStor

NovaStor® is Backup for the Rest of Us™ - providing powerful, affordable, all inclusive licensing that supports Physical, Virtual and Cloud environments. NovaStor provides data integrity solutions for both Small and Medium Business (SMB) as well as Enterprise markets that support best practices and protect data residing on Both Sides of the Cloud™ - Local, Remote offices and Data Centers are all capable of being managed from a Centralized Management Console. NovaStor's #1 rated SMB solution NovaBACKUP® is for businesses that understand they require critical data protection for their servers, VMware, Hyper-V or NAS environments but may be unsure of exactly what is required, or lack the resources to research and implement such a solution. NovaStor' Setup Assistance™ is an industry first where NovaStor provides backup experts to take on this complexity for the customer and recommend, install and support the solution that best suits their environment – all for no additional charge. NovaStor's Enterprise solution NovaBACKUP DataCenter™ brings F500 references, scalability, reliability and speed to the mid-market at an extremely disruptive price point. A single product manages both physical and virtual servers helping organizations meet RPO's and RTO's, save time, eliminate risk and dramatically reduce capital and operational costs. NovaStor is management-owned and has been profitable from the beginning. NovaStor currently has over 5,000 partners and hundreds of thousands of distributed product worldwide. NovaStor's global headquarters are located in Zug, Switzerland, has offices in Germany (Hamburg) and the USA (Agoura Hills), and is represented in numerous other countries through partnerships.

Koomey, Jonathan. 2011. Growth in Data center electricity use 2005 to 2010. Oakland, CA: Analytics Press. August 1. http://www.analyticspress.com/datacenters.html

The DCiE value was Introduced by the Green Gris in 2011. It serves to evaluate the energy efficiency of a data center. http://www.thegreengrid.org/

The website Big Data Challenges recommends disk pools for backup for speed and efficiency, but inactive data should be off-loaded to tape media as soon as possible to minimize energy consumption. Once it has been written to tape, data can be archived for future use without consuming power or occupying spinning disk space. http://bigdatachallenges.com/2012/03/19/50-energy-saving-tips-for-the-data-center/