



Data centres

Planting the seeds for green data

Steve Yellen, vice president of product and market strategy at Aperture Technologies, argues that striving for a greener data centre has become a business imperative as well as an environmental one

The 'Green IT' movement, once a concept relegated to a small group of environmentally concerned tree-huggers, is attracting attention from organisations around the world.

And with soaring energy prices, shrinking floor space and the generation of ever larger masses of data, the 'green data centre' is fast becoming a focal point of interest. Advances in information technology—including blade computing, virtualisation and server consolidations—have all contributed to a changing pattern in data deployments.

The increase in the number of installed servers has driven up power consumption more than any other element within the data centre architecture. On average, a medium-size data centre can generate 10,000 metric tonnes of carbon per year due to the power it uses. With high-density servers filling the racks, hot spots are being created that surpass 30 kilowatts per rack. As a result, many data centre managers are finding they cannot obtain enough power to distribute to the racks or that the power utility is unable to deliver additional capacity.

Recent statistics reported by the Environmental Protection Agency indicate the total power consumed by servers (including cooling and auxiliary infrastructure) represented approximately 1.2 percent of the total electricity used in the US in 2005 which is more than double the use when compared with 2000—with IT hardware and data centres being the leading national contributor to carbon emissions.

To further compound the issue, the costs associated with a kilowatt of electricity is rising significantly. Currently, power and cooling costs represent up to two fifths of a data centre's total cost of ownership. The Uptime Institute estimates the current three-year cost of powering and cooling servers is approximately one-and-a-half times the cost of purchasing server hardware. By 2012 power and cooling costs could represent 22 times the cost of hardware.

With such exorbitant costs on the rise, it has become apparent that substantial improvements in data centre efficiency and productivity must be made worldwide. Having the capability to support both current and future needs for computation with reasonable use of the planet's resource is now an imperative that can no longer be ignored.

The path to a greener data centre has traditionally been perceived as an onerous,

altruistic, journey. Increasingly, however, organisations are using green aspirations as a strategic opportunity to reduce costs, increase operational efficiency and ultimately optimise utilisation of data centre resources. Companies have begun to realise how environmental concern and business success can work in parallel—how a green data centre may be one of the best ways to accommodate growth and create a positive impact on the organisation's bottom line.

Standing up to be counted

One major reason why corporations have not implemented a green strategy to date is confusion as to what constitutes the best approach and what measures can successfully gauge whether specific strategies and technologies actually work. There is no clear industry standard with regards to measuring energy efficiency within data centres, but it is quite evident that a roadmap to assist companies in these efforts is desperately needed.

In response to the lack of standards and confusion, a new non-profit initiative, The Green Grid (www.thegreengrid.org), has been established by a consortium of information technology companies and professionals to promote energy efficiency and lower the overall consumption of power in data centres. By providing data and guidance, The Green Grid expects to assist data centre managers in making better decisions with respect to design, planning, deployment and day-to-day operations. The group is currently in the process of collecting real-time data from data centres in order to allow data centre managers and operators to assess their performance and benchmark against similar data centres. From this analysis, an initial technology roadmap and a baseline set of best practices will be developed for data centre managers to use as needed.

The Green Grid hopes to provide organisations with the ability to measure and monitor power consumption, data centre efficiency and data centre productivity in real-time. The development of standardised performance measurements and benchmarks for IT equipment and data centres is critical to achieving operational efficiency.

Five steps to a greener pasture

As the industry awaits a comprehensive roadmap, organisations can still take their first meaningful steps towards creating greener data centres.

1. Work out exactly what equipment you have running where. This information forms the starting point on your journey to a greener data centre. If you don't know what you've got or what it's doing you can't make informed decisions or measure improvements.

2. Identify and eliminate redundant 'ghost'

servers to deliver an immediate impact on the bottom line. Estimates currently indicate that by removing just one physical server from service can save £458 annually in electricity costs (assuming 6.5 pence per kilowatt-hour cost).

3. Implement holistic working practices. A single business model where both IT and Facilities work together will be critical to harness the power and cooling resources within the data centre. Having a tightly integrated group that combines both IT and Facilities cohesively will enable an organisation to fill in the necessary gaps and improve the overall business process. Additionally it allows users to understand metrics as well as move towards a greener way of doing things.

4. Monitor actual power. It may be different to manufacturers quoted ratings and with The Green Grid working on efficiency standards, you will be ready to calculate, benchmark and implement best practices.

5. Don't over-provision. Avoid over-provisioning by working out your business IT needs and then fitting the data centre around them. Plan for the future business IT needs to avoid over or under-provisioning.

Following a greener path has become much more than an altruistic endeavour. Organisations are focusing on developing green data centres in order to reduce exorbitant power and cooling costs as well as improve operational efficiency. It is apparent that the need to construct and operate green buildings will be more and more important for shareholder value and for the environment. New and emerging tactics and technologies are necessary to develop solutions that address today's critical business needs and environmental requirements. These will deliver economic benefits in an environmentally sound manner, while addressing power and cooling issues in the data centre. ■