

THE GREEN GRID

As the amount of data circulating on the internet and across computing devices increases exponentially, financial institutions around the world are aggressively filling data centre racks with powerful servers to keep pace. At the same time, energy shortages and energy costs are increasingly becoming economic and environmental concerns for organisations worldwide, explains **Vic Smith**, chair of the EMEA Technical Work Group at The Green Grid.

It is important for financial institutions to understand and be able to measure energy efficiency and quantify the effects of subsequent changes. The Green Grid, a global consortium of IT companies and professionals seeking to improve energy efficiency in data centres and business computing ecosystems around the globe, has taken up the challenge of developing standards and guidelines that will make it easier for IT managers to do this and help develop plans to manage their facilities and equipment to achieve optimal energy efficiency whilst still meeting the business demands placed on them.

expenses are absorbed by other functions in the organisation. As such, to assess the current state and future possibilities of the data centre there must be an alignment of the numerous people involved in its construction and maintenance.

Both IT and facilities departments must work together and share responsibility for the day-to-day operation of the data centre. However, it is also essential that there is visibility to the other levels of the organisation. The CFO should be engaged with the data centre operational costs as well as costs for procuring IT equipment.

power consumption and compare current performance efficiency to a new server platform.

By optimising the physical components of the data centre to current load and future predictions, there is the potential to eliminate up to 50% of electricity costs in real-world installations.

3. Evaluate the physical elements

One of the key challenges is the sheer size of your data centre. While size can be reduced through the removal of redundant servers, consider the possibilities of consolidating your most inefficient servers into a single new unit which will enhance performance, improve system utilisation and give you more space. This can also be financially advantageous through immediately lower energy consumption.

When buying this new equipment, look for a higher-specification with newly developed energy saving capabilities. The design choices made for the selection of equipment for a new, expanded or retrofit data centre will affect not only capital and operational costs, but also the efficiency of the cooling system and data centre as a whole. Therefore, it is vital that those decisions are made by the entire data centre team, including facility owners, IT owners and those individuals responsible for capital and operational budgets.

It is also important that total cost of ownership (TCO) and return on investment (ROI) are factored into the decision-making process

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These are the top six factors to consider when managing data centre operations with a view to making them as economical as possible.

1. Establish who is responsible

It is easy to pass the buck and believe that someone else is taking responsibility for the data centre. It is important to realise that this isn't the role of a single person. In many financial institutions, IT procures the computers, storage, and network equipment while the operating

2. Stay aware

It is startling how many managers don't know what equipment is in their data centre or how much electricity it consumes. Before any steps can be taken to improve efficiency, you must assess consumption and how much it is costing. As well as understanding how much you are spending it is also imperative to identify exactly where this is being spent.

Identify and analyse all existing IT equipment within the data centre, determine business purposes, measure

Alterations in the layout of the data centre alone can have significant implications on energy use and the efficiency of the air conditioning system. The ideal layout would involve hot-aisle/cold-aisle configurations with suitable air conditioner locations. The primary design goal of this floor layout approach is cool air and warm air segregation.

The location of vented floor tiles is also important. In an average data centre, many vented tiles are either placed in incorrect

locations or an insufficient or excessive number of vented tiles are installed. The ideal design would optimise cool air flow by “tuning” floor tiles through varying locations and by regulating the proportion of vents that are open at any given time.

3. Maximise settings and software

Many data centres do not enable power management features within the installed servers. Power-management features should always be enabled to ensure most efficient operation of the server.

The installation of more efficient power equipment triggers is also recommended. For example, lighting can become even more energy efficient through the implementation of timers or motion sensors.

4. Power down servers when they are not in use

Certain types of servers will regularly go unused for random, lengthy periods of time. These should be targeted for powering down. Typical examples are servers found in test and development environments. The test team will know when a test run has finished and the server is no longer in use.

5. Optimise cooling potential

A large factor in data centre efficiency is efficient cooling. The cooling systems of today's typical legacy data centre are often highly inefficient, primarily due to the fact that cooling high-density equipment was not originally a requirement. However, today there are numerous methods that

can be implemented within existing data centres and new set-ups.

The latest cooling technologies integrate cooling elements such as pumps, refrigeration, blower and heat exchangers within the IT equipment itself. These technologies blur the lines between what has traditionally been a clear delineation between facility equipment and IT equipment and with the correct measures, data centres can be optimised to save energy and money.

Once an efficient data centre is established, it is imperative to monitor and measure its performance.

In order to help financial institutions maximise their data centres and determine energy and financial savings, The Green Grid have also created a range of free online tools and design guides that help data centre operators. This includes a free cooling map which identifies how much outside air – also known as free cooling – is available for individual data centres across various regions.

6. Monitor and measure performance

Once an efficient data centre is established, it is imperative to continue to monitor and measure its performance.

Until recently, there has been a lack of a unified method for establishing and reporting server energy consumption. Fair comparisons for data centre energy

efficiency (and the components that comprise it) require a standardised set of performance and energy efficiency metrics.

Data centres are not like cars, in which there is a universal measure that everyone understands and relates to, for example miles-per-gallon. They are complicated machines, often built and upgraded in piecemeal fashion and added to and modified according to the business need. The factors are too many and variable to make developing measurements easy, which is why the measurements we are developing will be subject to constant evolution and improvement.

Adopt the globally-adopted PUE and DCiE metrics, which were implemented in last year's European Commission's Code of Conduct on Data Centre Energy Efficiency. These metrics help data centre operators clearly determine how much energy is consumed by IT equipment and how much is consumed by the facility itself. PUE and DCiE represent tactical measures that businesses can implement now to tell if it is possible to optimise the data centre before determining if they need a new one.

While this is a voluntary initiative from the EU, through continuous evaluation the data centre manager can identify opportunities to improve a data centre's operational efficiency, to compare efficiencies with competitive data centres and to determine opportunities to repurpose energy for additional IT equipment.

An efficient data centre has implications throughout a financial institution, not least on the bottom line. Through systematic and careful evaluation, efficiency can be significantly improved without upfront investment. FBA



Vic Smith

Vic Smith is chair of the EMEA Technical Work Group at The Green Grid, a global consortium of IT companies and professionals seeking to improve energy efficiency in data centres and business computing ecosystems around the globe. The organisation seeks to unite global industry efforts to standardise on a common set of metrics, processes, methods and new technologies to further its common goals.