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The intelligent approach to managing energy in data centres

Roger Woodward highlights the challenges of managing energy in data centres, and how these can be overcome by application of the latest controls technology.



In every sense of the term, data centres are big business. The global dependence on the world wide web has given rise to the construction of countless server buildings which are popping up all over the UK.

It is critical that these centres run twenty four hours a day, seven days a week, 365 days a year. Without data centres there are no emails, no Google, Facebook or LinkedIn. Many of today's businesses rely heavily on the internet to operate effectively – or even at

all. Data centres then are a crucial part of the infrastructure of the modern world.

And the management of these facilities is integral to their operation. Enclosed boxes housing row upon row of humming server equipment generate enormous amounts of heat and require careful delivery of the correct conditions to ensure they run in their optimum environment.

One Sightsolutions is a firm which specialises in providing systems to monitor

all critical and non-critical equipment in these buildings. Managing Director Graham Turner explains that a careful balance needs to be kept in the indoor environment: "Servers generate a lot of heat so they need to be cooled to a temperature that avoids heat-related down time issues. However, if they become too cool, and if they fall below the set point, the building will probably be using more energy than necessary. Monitoring that set point and maintaining it through good



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control are essential.”

He also points out that it is not only the servers themselves that require monitoring. Within the data centres it is also vital to have a way to continuously check performance of chillers, power distribution and air handling units.

Consequently, the infrastructure in these buildings has a critical role to play in their upkeep. Data Centre Infrastructure Management (DCIM) plans must, in these energy-conscious times, ensure they make provision for the best way to monitor how much energy a data centre is using.

According to findings by US firm Gartner Research, DCIM can lead to energy savings that reduce a data centre’s total operating expenses by up to 20 per cent.

This twin challenge of avoiding unnecessary energy costs and intolerable stress on the physical infrastructure that could lead to outages, requires a monitoring system that can oversee the performance of plant as well as the physical assets in those racks, and identify problems, is crucial.

Turner advocates the use of an open protocol monitoring system to help managers achieve this, and cites Tridium’s Niagara Framework as one such solution that can form the backbone of the DCIM plan.

He explains: “It gives a user access to view all components in the building to check if they are running as they should be. It’s also monitoring all the time, so if something goes wrong, it is reported back and alerts an operator that there is a critical situation. This can be done by email, SMS or pop-ups on computer screens. It’s that whole infrastructure being provided by Niagara.”

And use of an open protocol, such as the Niagara Framework, allows clients to unify those disparate pieces of equipment – from chiller to server rack.

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protocols, and Niagara has an embedded platform that can communicate with other protocols without any additional third party interfaces. It is unique in its method of doing that,” says Turner.

The open protocol approach has many advantages for data centre clients. They can more easily add equipment (for example, changing to a different air handling unit supplier) for upgrades. Open protocols also keep installation costs down because third party interfaces add to the costs of upgrades and additions. The ‘open’ approach is a more future-proofed method which is important in an industry where technology evolves at a dizzying pace.

Turner comments: “The way we used to

cool data centres and the way it is done now are very different. Designers are now using more of the ambient conditions rather than machines to cool, using outside air to cool the space rather than chiller.”

This is a more environmentally friendly approach that utilises the benefits of air conditioning but allows for a switch to natural ventilation when outdoor conditions allow. Again, high quality monitoring is central to a mixed-mode approach.

“Monitoring will tell the building managers when too much energy is being used, or when it is possible to switch to free cooling. It is all down to the design of the data centre, but the energy management system will be at the heart of monitoring those conditions,” says Turner.

Government figures estimate that data centres use around 3% of Britain’s total grid power. However, they are also key to the country’s economy - the ‘knowledge economy’ employs 41% of the population and data centres are the backbone of this. Getting to grips with energy use in this sector is therefore an important issue, not only for those directly involved in operating data centres.

Energy monitoring and the gathering of information seems like an appropriate solution for an IT-based sector. With an intelligent approach, and the today’s cutting-edge monitoring solutions, it is possible to retain the balance between data security and good energy management.

As Graham Turner says: “An intelligent monitoring system acts as a middle man between the hardware and the operator. It collects data and delivers it to the decision makers. This intelligent approach would seem to be the answer for any data centre manager aiming for that 20 per cent saving.”

Roger Woodward is managing director of Tridium in the UK.