

COOL RUNNING

Primary care trust to cut energy costs and carbon emissions
by up to 24 per cent with joint solution from Dell and APC



For the NHS, cost-efficiency and green IT are vital. As the government sets carbon emission targets, power and cooling in the datacentre are an increasing focus for energy-conscious IT managers.

SOLUTIONS:

- BACKUP, RECOVERY AND ARCHIVING
- GREEN IT
- MANAGEMENT
- VIRTUALIZATION



Northamptonshire

CUSTOMER PROFILE

COMPANY: NHS Northamptonshire
INDUSTRY: Public Sector
COUNTRY: United Kingdom
FOUNDED: 2006
EMPLOYEES: 400
WEBSITE: www.northamptonshire.nhs.uk

CHALLENGE

NHS Northamptonshire combined a move to its new headquarters with a datacentre refresh. The key goal was to reduce the trust's costs and carbon footprint by cutting power consumption. The Primary Care Trust (PCT) also wanted to maximise data protection and system stability.

SOLUTION

Dell engaged strategic partner APC, to deliver a robust, energy-efficient solution that complements the trust's move towards virtualized blade servers supported by Dell/EMC storage.

BENEFITS

Get IT Faster

- Datacentre up and running one week ahead of deadline, ensuring a smooth move to new building

Run IT Better

- Energy costs and carbon footprint expected to fall by up to 24 per cent
- Infrastructure efficiency set to rise by around 16 per cent
- Availability improves thanks to efficient power and cooling
- Proactive management tools simplify maintenance and optimise stability

Grow IT Smarter

- Sustainable energy savings optimise long term use of resources and funding



NHS Northamptonshire is responsible for the healthcare needs of around 680,000 people. The trust's aim is to be the best PCT in the East Midlands. To achieve this aim, it's important that it maximises the proportion of funds invested in healthcare services improvements. This requires meticulous planning of internal budgets and regular cost efficiency assessments.

IT is an obvious candidate for potential savings, particularly when the PCT's bid to cut its carbon footprint is also considered. Mark Austin, associate director of information management and technology, explains: "Put simply, the more effectively we run our IT systems, the more money we have to invest in patient care. If we cut total cost of ownership, the PCT can devote more funds to local services. And if we do that through energy savings, then we also help the trust meet government targets on carbon emissions."

When the PCT decided to relocate to a new head office, Austin saw an opportunity to renew the datacentre. Austin says: "The move was a great opportunity to identify potential savings and design an innovative, energy-efficient datacentre from the ground up."

Aware of the aggressive deadline for the project and the need to ensure a smooth

transition for the trust's 400 employees, Austin promptly began discussions with Dell. Dell has supplied NHS Northamptonshire with client solutions and servers for three years. Because this relationship forms part of a framework agreement, Austin was able to approach Dell as the preferred provider rather than releasing a request for proposal.



“EVERYTHING HAD TO BE READY WHEN STAFF ARRIVED AT THE NEW OFFICE. THANKS TO THE COLLABORATIVE APPROACH ADOPTED BY DELL AND APC, WE SUCCEEDED. IN FACT, THE DATACENTRE WAS FINISHED A WEEK EARLY.”

Mark Austin, associate director of information management and technology

HOW IT WORKS

HARDWARE

- APC InfraStruXure™
- Dell™ PowerEdge™ 2950 servers with Intel® Quad-Core Xeon® X5450 processors
- Dell PowerEdge M600 blades with Intel® Quad-Core Xeon® E5450 processors
- Dell PowerEdge M1000e modular blade enclosures
- Dell/EMC CX3-20 storage area network (SAN)

SOFTWARE

- APC InfraStruXure® Central v4.0
- VMware® ESX server software
- Dell OpenManage™ Systems Management

SERVICES

- Dell Global Infrastructure Consulting Services
- Dell ProSupport for IT
- APC support
- Education Services

Historically, the PCT used rack servers from Dell and one other solution provider. Some were standalone tower servers that consumed a lot of space and energy. In response, the IT team had started replacing towers with high-density, Intel®-based Dell™ PowerEdge™ M600 blade servers to economise on critical resources. "Part of the rationale for choosing the M600 blade server was our preference for Intel. VMware® runs most effectively on Intel processors. They also support our need for a dense, energy-efficient infrastructure and our staff were already comfortable working with them," says Austin.

Further consolidation was an obvious next step, so the team purchased additional M600 blades, along with VMware ESX server virtualization software to minimise physical hardware requirements through the deployment of virtual machines.

The replacement of tower servers will continue over the coming months. Eventually, all will be Dell PowerEdge M600 blade servers or PowerEdge 2950 servers. The PCT also chose a Dell/EMC CX3-20 storage area network (SAN) for secure, manageable storage.

The team was satisfied with its hardware choices, but wanted to invest in a new approach to racks, power and cooling "Our aim was to make the new server room as efficient and green as possible. Dell used its strategic partnership with power and cooling specialist APC to introduce the expertise we needed," Austin says. "We also had confidence in Dell's experience of similar joint projects at other trusts."

Data protection and system uptime were also key considerations.



“THANKS TO THE DELL/APC PROJECT, OUR CARBON FOOTPRINT WILL DROP BY APPROXIMATELY 121 TONNES PER YEAR, WHICH IS EQUIVALENT TO THE OUTPUT OF 39 CARS.”

Mark Austin, associate director of information management and technology

“We have to meet strict governance requirements designed to protect patient data. In addition, we wanted to provide the best possible service to staff by reducing the risk of server failure,” Austin says.

Consultants from Dell and APC worked with the IT team at NHS Northamptonshire to conduct a detailed assessment of the trust’s needs and design a customised solution. APC’s InfraStruXure® formed the basis of these discussions. APC InfraStruXure® integrates power, cooling, rack, management and security features to provide a scalable on-demand architecture. Specifically, it uses in-line, rack-based cooling, which avoids the high cost of cooling an entire server room and reduces the risk of hotspots. With extensible management tools, the system ensures that datacentre conditions are easy to manage and issues swift to resolve. “APC’s solution was ideal. This offered a greener, safer, less expensive approach to cooling.”

The design process also considered the role played by building contractors, commissioned in a separate tender to install an external generator, water chiller and fire suppressant system to support and secure the new datacentre. The requirements of the PCT’s chosen networking provider were also integrated. “Dell and APC gave us precise data on the savings to be made, so we were confident that we were making an investment capable of delivering sustainable returns. What’s more, we saw that the APC system would improve availability for end users.”

SMOOTH INSTALLATION DOWN TO TEAMWORK

The project took just two and a half months, from order to completion. The move to a new head office – which involved transferring 400 people – went smoothly, with minimal disruption. “Everything had to be ready when staff arrived at the new office. Thanks to the collaborative approach adopted by Dell and APC, we succeeded. In fact, the datacentre was finished a week early,” Austin says.

The team was particularly impressed with APC’s collaborative approach. “APC’s consultants were flexible and responsive.

When the cabling company needed racks to be installed earlier than planned, APC put in the extra effort to make sure it happened,” Austin says. “Everything was new – right down to the windows and doors – so it had to be an integrated process. APC attended our building contractor meetings, worked out detailed timelines and managed the deployment from start to end.”

EXPECTED ENERGY SAVINGS OF UP TO 24 PER CENT

In a traditional datacentre, rack density is partly determined by the limits of the cooling system. Perimeter cooling, which uses ceiling units to cool the whole datacentre, works for low or medium density infrastructures. But when density is high, the risk of hotspots rises, and energy consumption climbs.

With its APC solution, NHS Northamptonshire combined high density with low energy consumption. InfraStruXure® is compatible with all Dell hardware and maximises airflow through each rack without escalating costs. The fans in the cooling units operate at variable speeds according to demand, so that energy isn’t expended needlessly. For example, during weekends the trust’s datacentre will consume less energy because the fans will slow down in response to lower heat levels. On Monday morning, when staff return to work, the fans will speed up.

Austin says: “We have a lot of hardware in a small space, which requires a highly effective cooling system. The APC system met this need with targeted row-based cooling that will increase infrastructure efficiency by around 19 per cent and cut our annual energy costs by an expected 24 per cent.¹”

The energy-saving benefits of virtualization complement the APC solution by reducing the number of physical servers required. This supports the high-density, high-efficiency datacentre by minimising power and cooling requirements. “Virtualization, Dell Energy Smart servers and the APC InfraStruXure® go hand in hand. With this combination, we’re confident that we’re doing everything we can to deliver a cost-effective infrastructure. As a result, we’ll release funds for direct investment in patient care.”

Using the latest edition of VMware, Austin and his team can easily move all virtual machines onto just a few physical servers each Friday so that the remaining servers can be powered down for the weekend. “Since implementing VMware virtualization software, we’ve consolidated our servers by around 10 per cent. This has generated an equivalent saving on electricity,” says Austin.

POWERING DOWN FOR GREEN IT

“As a trust, we’re keen to address our carbon footprint,” says Austin. “Technology presents an opportunity to minimise our environmental impact and move closer to government targets to reduce the overall level of primary energy consumption by 15 per cent from March 2000 to March 2010. These considerations were integral to the design of our new server room.”

With a 24 per cent reduction in annual electricity consumption, the PCT will see a proportionate fall in carbon emissions. “Thanks to the Dell/APC project, our carbon footprint will drop by approximately 121 tonnes per year, which is equivalent to the output of 39 cars.”

“Dell and APC collaborated to define a system that met our energy targets while ensuring optimal cooling for our high-density server setup,” says Austin.

COMPREHENSIVE SECURITY MEASURES PROTECT DATA AND INCREASE AVAILABILITY

Data protection and high availability were paramount. The trust wanted to protect its hardware investment and optimise end-user experience. To achieve this, Austin and his team had to minimise vulnerability to power outages and temperature rises. This would ensure optimum performance and longevity for the trust’s servers and Dell/EMC storage.

The APC system offers cooling capabilities of 20kW per rack, minimising temperature rises and avoiding damage to hardware. “The APC system reduces hotspots, so we can expect a longer lifetime for our hardware and increased day-to-day performance,” explains Austin.

1. Calculations delivered by APC, based on comparison with a legacy datacentre.

“THE STRENGTH OF DELL’S ALLIANCE WITH APC PROVED ESSENTIAL. IT GAVE US THE IDEAL COMBINATION OF TECHNICAL AND LOGISTICAL EXPERTISE, AND A SOLUTION THAT ANSWERED OUR NEEDS.”

Mark Austin, associate director of information management and technology

A redundant design removes single points of failure, while hot swappable components ensure that the IT team can resolve issues quickly. It also includes a centralised UPS that provides a uniform temporary source of power should the main supply fail.

Meanwhile, the Dell/EMC CX3-20 storage area network provides flexible, scalable storage simply by just adding more disks in the spare slots. This includes high speed transfers, back-up to disk and replication. It also avoids a single point of failure through multi-path I/O. “With Dell/EMC storage and a robust power and cooling system, we’re confident that our data is safe. Thanks to Dell and APC, we have a secure environment that will improve availability for staff and comply with governance requirements,” says Austin.

MANAGEMENT TOOLS SIMPLIFY MAINTENANCE AND BOOST DATA PROTECTION

The trust also installed the APC environmental management system. This helps the team identify and resolve issues before they affect end users. “If the temperature in a rack goes out of range or humidity rises, we get an alert. Before, we only knew when an end user called the helpdesk and told us about a problem. Now, we’ll be able to solve issues proactively before they filter through to employees.”

The system also includes a monitoring card that delivers remote alarms to mobile devices. “With the APC environmental monitoring card, we’re immediately aware of potential issues, even if we’re miles away from the datacentre.

We always have a technician on call to resolve issues, but in the past he or she had to be onsite.”

KNOWLEDGE TRANSFER AND SUPPORT MAXIMISE RETURN ON INVESTMENT

Dell ProSupport for IT Mission Critical four hour option also raises uptime for servers and storage. “With Dell ProSupport for IT Mission Critical and Fast Track Dispatch, we can be sure of a rapid onsite response, with first-line diagnostics completed in-house to speed up resolution.” For the power and cooling system, the PCT has support from APC, including a direct line for telephone support and a service level agreement for onsite repairs.

Dell and APC consultants were available throughout the project for advice, as well as continuous knowledge transfer. Dell provided three days’ comprehensive onsite training on Dell/EMC SANs. “APC and Dell gave us the skills we needed to maintain and develop our infrastructure with confidence,” says Austin. “The strength of Dell’s alliance with APC proved essential. It gave us the ideal combination of technical and logistical expertise, and a solution that answered our needs.”

For more information on this case study or to read additional case studies, go to www.dell.com/casestudies and www.dell.co.uk

This case study is for informational purposes only. DELL MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS CASE STUDY.



SIMPLIFY YOUR TOTAL SOLUTION AT DELL.COM/Simplify



Availability and terms of Dell Services vary by region. For more information, visit www.dell.com/servicesdescriptions
© May 2009, Dell Inc.

Intel and Intel Xeon are registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.