Flintshire gains a greener IT landscape with IBM

Overview

- ***The Challenge***
  Flintshire as an organisation has ambitious goals to reduce its power consumption and cut carbon emissions. For the growing IT infrastructure, the emphasis is on eliminating "white space" in servers and storage devices through consolidation and virtualisation.

- ***The Solution***
  Flintshire will remove a total of 80 physical servers from its infrastructure by virtualising them to VMware partitions on six IBM System x3950 servers.

- ***The Benefits***
  Virtualisation will remove the capital and operational costs associated with 80 physical servers, as well as their significant lifetime carbon footprint; Flintshire now buys around five physical Intel processor-based servers each year, compared with more than 40 in previous years; the use of server virtualisation on the IBM System x platform supports ultra-rapid provisioning of new servers, with lower total power and cooling requirements.

Flintshire County Council (www.flintshire.gov.uk) provides municipal services to 150,000 citizens, and has a combined annual revenue/capital budget of £360 million. As a unitary authority, Flintshire offers around 750 distinct public services, and runs around 350 business-critical systems to support them.

Beyond its statutory obligations to increase energy efficiency and reduce carbon emissions, Flintshire is taking a proactive stance on climate change. The Council runs an extensive recycling programme and is piloting a ground source heat-pump scheme for public housing that promises to cut the use of fossil fuels. The IT function is also playing a significant role in making Flintshire greener, as John Thomas, Operational Services Manager, explains:

"Our aim has always been to create a highly available, flexible and scalable architecture to support a growing range of services and ever increasing user expectations. We achieve this goal largely through virtualisation, which cuts power consumption and carbon emissions, and significantly reduces the amount of hardware we need to buy, run, and ultimately dispose of."

Lifetime efficiency gains

Flintshire has employed virtualisation for many years on the IBM System i and System p platforms, and today runs IBM i5/OS, IBM AIX and Linux side by side in virtual partitions on two IBM System i 570 servers. The organisation has also virtualised its storage, using IBM System Storage SAN Volume Controller to create a more flexible and efficient SAN. Without virtualisation, John Thomas estimates that the Council would require another 30 per cent more capacity on top of its existing 60TB.

He comments, "Virtualisation not only reduces electricity consumption

and cooling requirements at the point of use, it also eliminates the raw materials, energy and packaging that would have gone into manufacturing and shipping the additional hardware we would have required. That also translates into savings in capital and operational expenditure."

The x factor

Based on its positive experience of virtualisation on System i and on its SAN, Flintshire decided to virtualise its Microsoft Windows infrastructure to VMware virtual servers on the IBM System x platform.

Flintshire implemented four IBM System x3950 servers, currently running a total of 40 VMware servers. A further two x3950 M2s are now being implemented in preparation for new workload – a major, 500-user social care system and a new payroll solution for 7,500 direct employees. The x3950s feature vector cooling: air passes over the hottest components last on its way out of the machine case, increasing the efficiency and efficacy of cooling.

"We've tested the x3950 with up to 30 VMware servers without coming close to the limit, so there's plenty of headroom," says John Thomas. "Using virtualisation on the x3950s, we've removed or redeployed 40 physical servers to date, and anticipate removing a further 40 over the next 12 months."

Flintshire already uses IBM Director software to manage its System x, IBM BladeCenter and System i servers, and plans to introduce the Active Energy Manager (AEM) plug-in. AEM enables the creation of intelligent power policies, with the ability to automatically throttle back or power down System x servers when not in use.

Planning for a greener future

The long-term aim at Flintshire is – where appropriate – to virtualise every element of the infrastructure. All new Windows applications or databases are installed in the VMware environment on the x3950s whenever possible. Flintshire can reallocate the available resources whenever required, so that each virtual server is precisely the right size for its workload. More demanding applications – in particular, Citrix – go onto IBM BladeCenter. Only as a last resort will Flintshire use rack-mounted servers.

"IBM BladeCenter gives us a compact environment in which each blade has only the components it needs, with shared power, networking and cooling," says John Thomas. IBM BladeCenter typically has a 25 per cent smaller environmental footprint than the equivalent rack-mounted servers in terms of power consumption and heat generation.

With BladeCenter and server virtualisation, Flintshire has avoided deploying additional rack space and making power and cooling upgrades. Following a power audit, Flintshire is now running its data centres two degrees warmer, with no detrimental effect on the service as a whole. The air-conditioning in both centres uses "free air cooling" – filtering cold air from the outside whenever possible to reduce power consumption.

"The success achieved by Flintshire is a real-life endorsement of IBM's leadership in green IT," comments David Lockwood of IBM System x.

"With technology and services spanning every aspect of the data centre, IBM is the ideal partner to help Flintshire improve energy efficiency across the entire infrastructure," concludes John Thomas.

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