Leeds Teaching Hospitals NHS Trust

Storage Virtualization & Data Tiering - Case Study

CUSTOMER QUOTE:

“Since installation the Dot Hill storage arrays have required no administration, they just work.”

IAN DAVISON
Head of IT (Operations)
LEEDS TEACHING HOSPITALS NHS TRUST

BACKGROUND

Leeds Teaching Hospitals NHS Trust (LTHT) was formed in 1998, bringing together two smaller hospital trusts under a single management and direction for the first time. Whilst their hospitals are part of a modern, forward-looking institution, their roots stretch back almost 250 years.

They have a distinguished history which mirrors the evolution and expansion of the city of Leeds itself and their proud tradition of care, clinical expertise and innovation continues to the present day. Leeds Teaching Hospitals is one of the biggest NHS trusts in the UK offering a full range of specialist and general hospital services. They have an international reputation for excellence in specialist care, research and academic training.

The IT Operations division supports all IT services across the Trust’s 7 hospitals including both clinical support services and patient facing applications most of which require mission critical 24x7 availability.

With the move to reduce paper based patient records across the Trust and the automation of patient check-in procedures with a self service kiosk based system the IT Operations team faced a challenge in 2013 to develop a new storage architecture capable of meeting peaks in demand for a multitude of new and existing applications. Furthermore the new storage infrastructure would need to provide seamless scalability to accommodate data growth across the Trust’s entire IT environment.
Key Storage Issues

In early 2013 the IT Operations division were planning the role-out of a number of new applications including a Health-view Paperlite system which forms a key part of a move from paper-based to electronic health care. The system would serve approximately 5000 users across the Trust to view archived patient records and meet UK government initiatives to significantly reduce the amount of paper records held within the NHS. Inevitably more storage capacity would be required, however the Trust had been making significant use of virtual server technology to maximize resource utilization and provide availability and scalability for the vast number of mission critical applications required to support both patients and medical staff across the Trust.

Designing to meet dynamic workload demands of a virtual infrastructure

The Health-view Paperlite system was just one of several applications to join their virtual server infrastructure based on VMware ESX 5.1. Their complete application set presented a mixture of data workload characteristics, some of which were driven by human activity such as the patient check-in kiosk system, but also machine driven workloads presented by medical instrumentation, plus the ongoing back-scanning of archived patient records from the Paperlite system. Application virtualization results in dynamic data workloads with peaks in demand that are often difficult to predict. The IT Operations division

CUSTOMER QUOTE:

“We had explored dynamic auto-tiering data storage solutions in the past but they had been beyond our budget so when we learnt that Dot Hill had brought this technology within our financial reach we were quick to explore it.”

IAN DAVISON
Head of IT (Operations)

had explored dynamic auto-tiering data storage solutions in the past but these had been beyond budget. During the planning phase for the Paperlite system Leeds worked with their long term IT systems advisor NexStor who recommended the Dot Hill AssuredSAN Pro 5000 real-time auto-tiering data storage system as an ideal candidate to provide the storage backbone for their entire virtual server environment.

The Trust had experience of the Dot Hill AssuredSAN range of products having very successfully deployed two Dot Hill AssuredSAN 3000 series storage arrays in 2012 to support a Genetic Sequencing application which had ran faultlessly since installation. In February 2103 two Dot Hill AssuredSAN Pro 5720 arrays were installed each hosting 58TB of data connected by a new 8GB fibre channel infrastructure based on new switches from QLogic. The two arrays provide redundancy with fail over delivered by VMware and data backup services are provided through Veeam Backup software.

The Dot Hill AssuredSAN Pro 5720 is an automated data tiering solution which uses a mixture of solid-state (SSD) and traditional SAS hard drives, all managed by intelligent RealTier™ software from Dot Hill which continuously monitors incoming data requests and migrates data sets to the most appropriate storage medium to deliver the highest performance. The key to this system is that the data movement occurs in real-time unlike other auto-tiering solutions which perform data migration as a batch process at a later point in time. With this method of operation the Trust can be sure that data sets in high

Leeds Teaching Hospitals NHS Trust serve over 5000 users with 24x7 support
**Leeds Teaching Hospitals NHS Trust - Case Study**

demand are moved in real-time to the high performance SSD tier with their Dot Hill AssuredSAN 5000 series arrays, ensuring that both patients and medical staff receive the best application response times possible, 24 x 7.

**Delivering a storage infrastructure for reliability and future growth**

Although the Health-view system presented the initial requirement for a new storage infrastructure, the performance of the Pro 5000 systems proved to be easily capable of supporting a much wider range of applications hosted within the VMware environment. Critical applications now supported by the auto-tiering system include a new patient flow and management system which controls patient check-in kiosks at the hospital. This system forms part of ongoing measures to improve the patient experience and requires uninterrupted service in order ensure accurate and timely management of the patient check-in process.

Further mission critical applications supported by the AssuredSAN 5720 systems include a Renal Reporting System supplied by Vital Pulse which is an industry-standard SQL based system providing interfaces to dialysis machine networks, laboratory and PAS interfaces and data conversion to national standards, including the UK Renal Association time line. This system serves approximately 80 medical consultants across all of the NHS Trust in the northern counties and also provides links to UK Renal Registry.

**Dot Hill AssuredSAN storage - fully certified for VMware, Veeam & Citrix**

One vital criteria within the Trust’s storage system selection was full compatibility with VMware and associated software tools such as Veeam. “We needed to be sure that our chosen solution would be fully certified for use within our VMware environment”, explained Ian Davison. Dot Hill’s external RAID storage arrays, based on the AssuredSAN architecture, have been rigorously tested and certified by VMware for use with VMware ESX 4.1, ESXi 5.0, ESXi 5.1 and SRM 5.0. In addition, AssuredSAN storage arrays are certified for use with Veeam Backup & Replication and they have full verification with Citrix® Including XenServer 5.6.

**Using Veeam® Backup & Replication™ with Dot Hill AssuredSAN™ storage**

The move to a VMware environment has greatly simplified and accelerated the commissioning of new applications or additional compute nodes through the use of virtual machines (VM). Furthermore, application provisioning, maintenance and disaster recovery are now very simple and rapid tasks. Leeds have been utilizing Veeam #1 Backup & Replication which can provide fast recovery of VMs in as little as two minutes using Veeam’s Instant VM Recovery on Dot Hill storage. “The use of Veeam Backup & Replication has provided a great way to archive virtual machine images and bring particular application sets online within minutes”, highlights Ian Davison.

**Conclusion**

By implementing real-time autonomic tiering the Leeds Teaching Hospitals NHS Trust can ensure that application data sets demanding maximum performance can take advantage of fast SSD technology at the moment they need it most. This provides performance acceleration for a wide range of applications without the need to invest in large amounts of flash based storage and also eliminates the complication of having to determine which data sets need to reside on the most expensive storage tier.

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**CUSTOMER BENEFITS AND OUTCOMES**

- Fully certified VMWare ESX & SRM data storage environment
- Veeam certification for easy VM backup and restore
- Easy licence-free storage capacity expansion

VMware ESX 4.1, ESXi 5.0, ESXi 5.1 and SRM 5.0. In addition, AssuredSAN storage arrays are certified for use with Veeam Backup & Replication and they have full verification with Citrix® Including XenServer 5.6.
About Dot Hill AssuredSAN 5000 Series

Dot Hill’s AssuredSAN Pro 5000 Series adds automated tiered storage capabilities to our SAN storage line-up. Using the Pro 5000 Series with integrated RealStor™ management software, IT managers can improve data responsiveness, remove provisioning and allocation guesswork, and simplify storage management and expansion. RealStor, Dot Hill’s unique, patent pending software takes tiered storage to a more advanced level - beyond batch data migration to Real-Time automated tiered storage, that continuously responds to user data demands by moving ‘hot’ data to a high-speed SSD tier.

The AssuredSAN Pro 5000 Series is seriously smart storage, with built-in intelligence that responds to data access needs autonomically, or without human intervention or policy setting. The AssuredSAN Pro Series, with RealStor software takes tiered storage to a new level – beyond other automated tiered storage solutions using off-hours batch migration, and into a new era of autonomic, real-time data tiering.

The AssuredSAN Pro 5000 Series is a high-performance, highly available and reliable integrated storage solution that delivers consistently faster access to current data with built-in, real-time autonomic tiered storage and virtualization. The AssuredSAN Pro Series detects priorities for data access immediately to optimize the delivery of priority/high demand data in real time. Faster I/O is achieved in part through real-time, automated data tiering, which prioritizes data files, volumes or blocks between tiered storage using built-in analysis and data scoring.

Dot Hill RealStor technology includes many other innovative patent pending storage capabilities that both improve the system performance and user experience, and translate into return on investment.

About NexStor

Founded in 2004, NexStor Ltd is a vendor independent, Quality Assured (ISO9001) Data Systems Integrator specialising in data storage and data management solutions including SAN design & implementation, backup and recovery, DR and ILM Solutions utilising proven technologies to reduce the cost of storing and managing information.

Being independent from our technology vendors enables our approach to be as open and forward thinking as possible: having more than one solution to most business issue sets NexStor apart in the data storage market space.

Based in Nottingham, NexStor has clients UK wide, as well as Europe, the Middle East & the U.S. Our clients include numerous NHS trusts, top UK Universities, the worlds largest investment banks, leading TelCo’s and major worldwide manufacturing enterprises.

For more information regarding NexStor, visit http://www.nexstor.co.uk

For more information about Dot Hill Systems, visit http://www.dothill.com

For more information about Leeds Teaching Hospitals, visit http://http://www.leedsth.nhs.uk/home/