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Ewan Johnson
Quantum Storage UK

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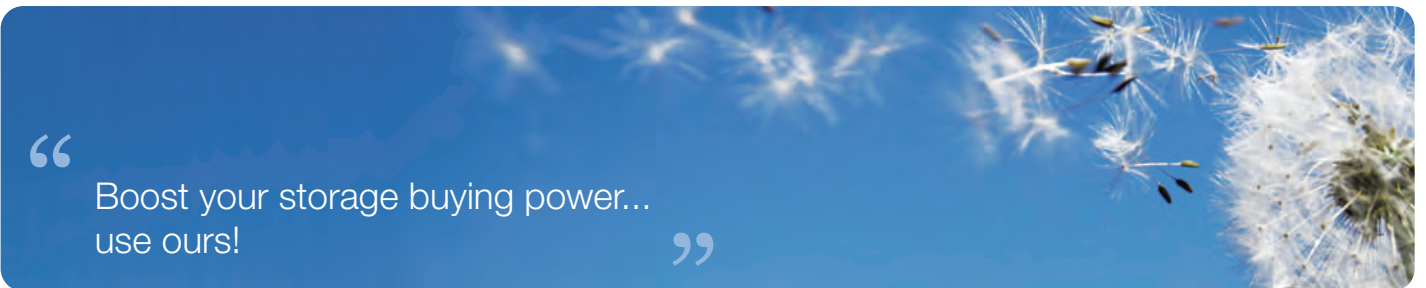
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Biochemists at Oxford University safeguard valuable data with HP-Quantum solution

“Combining HP hardware with Quantum’s StorNext Data Management software provides a comprehensive storage, backup and archiving system. Researchers no longer worry about accessing or losing valuable information because the solution maximises Storage Area Network (SAN) performance and offers an all-embracing disaster recovery capability. Its scalability and manageability ensure that we will easily cope with vast amounts of data for the foreseeable future.” Richard Bryan, research computing manager, University of Oxford, Department of Biochemistry

Objective

University of Oxford, Department of Biochemistry wanted a comprehensive long-term data storage, archiving and retrieval system with a disaster recovery capability.

Approach

Deployed an HP-Quantum solution comprising HP StorageWorks hardware and Quantum StorNext Data Management software.

IT improvements

- Highly reliable and scalable storage, backup and archiving platform.
- Comprehensive disaster recovery capability.
- Maximises Storage Area Network (SAN) performance and offers rapid access to stored data.
- Automated backup and recovery from disk or tape.

Business benefits

- Reassures existing and potential stakeholders that valuable data is safe.
- Reinforces the University’s ranking in the field of Biomedicine, which attracts World-class scientists.
- Encourages interaction with scientists outside of the department, enhancing collaboration.

HP customer case study:

University of Oxford, Department of Biochemistry deploys an HP-Quantum storage, backup and archiving solution to protect a rapidly growing volume of research data

Industry:

Higher education



The Department of Biochemistry forms part of Oxford University’s Medical Sciences Division, the largest of the establishment’s four academic divisions and ranked third in the World for biomedicine. With approximately 400 research staff and some 350 undergraduate members, the department provides a multidisciplinary and collaborative setting for cell, developmental, computational and structural biologists as well as biochemists and geneticists. Research areas include cell and chromosome biology, genes and development, glycobiology, molecular biophysics, and molecular and systems biology.



“The reliability of HP hardware has impressed us for years and the StorNext software offers value-for-money, scalability, performance, intelligent archive and data protection”

Richard Bryan, research computing manager, University of Oxford, Department of Biochemistry



Scientific techniques create vast data volumes

Prestigious and World-renowned research organisations like Oxford University's Department of Biochemistry require modern facilities to attract top workers in the field, produce high-quality research and secure grant funding. To forge interdisciplinary collaboration between researchers from different scientific groups, the department plays an important role within the Oxford Centre for Integrative Systems Biology (OCISB) which is funded by the Biotechnology and Biological Sciences Research Council (BBSRC). In 2008, the department moved to a new purpose-built building, which incorporates extensive computing facilities.

Over recent years, computing has become a very powerful tool in the biochemist's armoury as researchers strive to interpret the expanding data volumes generated by techniques such as X-ray crystallography, optical microscopy and molecular dynamics. Data from the OCISB currently totals 30TB, which could potentially rise to 80TB within one year.

“Whether researchers are looking at protein structures, the interaction between proteins and other cell structures or how these relate to macroscopic cell properties, scientific techniques create vast quantities of data. Digital optical microscopy is especially data intensive because it generates three-dimensional scans showing the movement of fluorescently-labelled proteins within living cells,” explains Richard Bryan, research computing manager, University of Oxford, Department of Biochemistry.

Several computer clusters with a total of nearly 500 Central Processing Unit's (CPU's) running various versions of Linux provide the department with the necessary computing power. Over time, a very fragmented backup and archiving system evolved as different groups used six separate disk storage and local tape backup systems.

“This is not the way to deal with such a valuable asset. Everything should be stored, backed-up and archived because the University, grant-awarding bodies, academic journals and researchers want data in a readily accessible form,” continues Bryan. “We needed a homogeneous approach to long-term data storage via a proper archiving and retrieval system with a disaster recovery capability. Moving to a new building provided an ideal opportunity to review our storage requirements.”

HP hardware and Quantum software unite

HP chose to recommend Quantum StorNext as the best solution to a tender offer by the customer. Whilst examining the proposals the customer made several reference calls to other higher educational establishments and attended a demonstration of the HP-Quantum solution, which comprises HP hardware and Quantum StorNext Data Management software. “The reliability of HP hardware has impressed us for years and the StorNext software offers value-for-money, scalability, performance, intelligent archive and data protection,” says Bryan.

The HP component of the solution comprises an HP StorageWorks Enterprise Virtual Array (EVA) 8100 and two HP StorageWorks Enterprise Systems Library (ESL) 322 E-Series Tape Libraries. The EVA has 450GB Fibre Channel (FC) and 1TB Fibre Attached Technology Adapted (FATA) drives for tier one and two storage whilst an ESL provides tier three archival storage. The second ESL provides a disaster recovery capability in a nearby building. A pair of HP ProLiant DL360 servers running Suse Linux Enterprise (SLES) 10.2 manage the StorNext Filesystem and Storage Manager.

A further five ProLiant servers on the SAN, using either Linux or Windows, can simultaneously access the StorNext filesystems, and are available both to run applications and to serve the filesystems over the building Local Area Network (LAN) to remote clients, using either Network File System (NFS) or Common Internet File System (CIFS). The Windows servers also provide management capability for the EVA and ESL.

Quantum StorNext software, FileSystem and Storage Manager, provide a file sharing and long-term data repository capability by moving data around between tiers one and two, and to the primary and secondary site tape libraries. HP installed Brocade switches to create a Storage Area Network (SAN) and introduced Fibre Channel (FC) over Internet Protocol (IP) gateways for inter-site replication. HP and Quantum collectively designed the solution and implemented and managed the project.

“StorNext is specifically designed to meet the needs of customers with the most challenging data management requirements. By providing high-performance data access and low-cost, long-term data retention, StorNext addresses the difficulties created by the exponential data growth occurring in the Biomedical industry.”

Ewan Johnston, EMEA software sales director, Quantum Corporation

New storage platform offers scalability, performance and disaster recovery capability

Following the relocation to new premises and to accommodate additional computer clusters in the future, the Department of Biochemistry now has space for 36 racks in its computing facility; three house the HP-Quantum solution. Today, it has a

Customer solution at a glance

Primary hardware

- HP ProLiant DL380 and DL360 servers
- HP StorageWorks Enterprise Virtual Array (EVA) 8100
- HP StorageWorks Enterprise Systems Library (ESL) 322 E-Series Tape Library

Primary software

- Data storage, backup and archiving

highly resilient integrated storage, backup and archiving platform that will readily cope with future data volumes.

“StorNext is especially attractive for several reasons,” reveals Bryan. “Unlike other solutions, it offers simultaneous access to the same file system from different SAN servers and we can directly share the same file system regardless of the operating system, maximising SAN performance. Moreover, to boost performance further, the StorNext File System and StorNext Storage Manager are fully integrated; files from FC, SATA or tape automatically move to the appropriate destination.”

This robust solution also offers enhanced data accessibility and an excellent disaster recovery capability. Scalability ensures that the growing volume of research information generated by highly data-intensive techniques is safe, protecting the department’s world renowned reputation and reassuring potential grant funders.

“Especially important to the light microscopists is the solution’s ability to safeguard work instantly; it immediately creates tape copies to both sites whenever a file goes to disk. The system currently stores approximately 15TB of new data and we will shortly migrate 30TB of old data from our mass Arrays. In the near future, we estimated that data volumes from light microscopy and molecular dynamics could reach at least 500GB per day,” concludes Bryan.

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