

The University Hospitals of Leicester NHS Trust



The University Hospitals of Leicester NHS Trust makes the case for Content Addressed Storage

How does a leading British hospital network manage the stellar growth in data arising from ultrasound, x-rays, MRI scans, CT scans, and other forms of fixed-content information? In a Utopian world, it would all reside on a SAN or a NAS environment—but the value of information changes over time. Although it has always been crucial to retain unchanging digital assets for active reference and long-term value, they now needed to be stored to a flexible, scalable environment offering a minimal total cost of ownership.

Working closely with its LAN and IP provider, Omnetica, The University Hospitals of Leicester NHS Trust has implemented an EMC Centera content addressed storage (CAS) solution to meet the unique requirements of its rapidly growing fixed digital image content. The Trust is making critical information more productive across its entire lifecycle, managing information based on its changing value, and ultimately protecting more information more affordably.

The University Hospitals of Leicester NHS Trust provides services on three main hospital sites within the City of Leicester, UK: The Glenfield Hospital, The Leicester General Hospital, and The Leicester Royal Infirmary. Together, they have more than 2,300 beds, and 10,500 staff. They provide a range of A&E, in-patient, day case, day hospital and out-patient services within many specialty groupings, including Orthopaedics, Critical Care and Theatres, Cardiac Services, Gynaecology and Integrated Medicine.

When the three hospitals merged in April 2000 to form the current NHS Trust, there was a goal to streamline and integrate the multitude of different systems and technologies used at each site. Following a rigorous evaluation process, EMC was selected to implement a unified, high availability information storage infrastructure. The adoption of the EMC Symmetrix systems, EMC Celerra file servers, EMC Data Manager and the EMC ControlCenter management suite created an open, high performance, and high availability

Storage Area Network (SAN) and Network Attached Storage (NAS) environment, within which critical patient and hospital information could be accessed, recorded, and analysed at any time of the day or night. This information includes the Trust's Patient Archiving and Communications Systems (PACS) which is used to store patient images digitally and 'Enconcert', an ultrasound-based cardiography (ECHO) system.



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—Bill Remmer, Assistant Director of Information Management and Technology (Computer Operations)

The changing value of information

Things have moved on considerably though since that groundbreaking deployment three years ago, as Bill Remmer, Assistant Director of Information Management and Technology (Computer Operations) explains. “Our original goal was to place all our critical information on the SAN,” he says. “But the value of information changes over time, owing to changing service levels, legislative requirements, business continuity needs, and application demands. And although it was crucial to retain unchanging digital assets for active reference and long-term value, they needed to be re-purposed to a flexible, scalable storage device offering a lower total cost of ownership—leaving the SAN to concentrate on critical transactional and other dynamic hospital information storage needs.”

The 10-year business model for Radiology Services convinced Remmer and his team that an alternative, equally flexible, but more cost effective storage solution was needed for unchanging, non-transactional information. “The Trust's Radiology Services—such as ultrasound, x-rays, MRI scans, and CT scans—forecast a 30 percent annual increase in their capacity requirements. This is partly due to the greater demand for these services, the ability of the technology to scan by more detailed ‘slices’, and the demand from medical professionals and legislation to retain the information for longer periods of time. From this forecast, we were able to calculate the anticipated growth in information over the next ten years. We were looking at a growth of up to 16 terabytes annually in fixed content.”

Based on the highly successful experience with the EMC-powered SAN, the Trust was eager to explore the lower total cost of ownership advantages of including EMC Centera to manage this explosive fixed content growth. This next-generation content addressed storage (CAS) solution is specifically designed to meet the unique requirements of fixed content—and was the ideal solution for providing the Trust with instant online radiology file access, assured content authenticity, and seamless scalability. Specific applications which reside on the EMC Centera system include Digital Healthcare for digital retinopathy, and Agfa for a DICOM server.



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The Trust worked in close partnership with the highly professional LAN and IP service provider Omnetica to implement the solution. The EMC Centera relies exclusively on the Trust's IP network to share electronic patient images around the hospital, and Omnetica skilfully qualified the architecture beforehand to ensure maximum performance, availability, and scalability. “The Omnetica team drew on their extensive experience in public sector healthcare to design and implement a showcase CAS environment,” says Remmer.

By introducing EMC Centera CAS solution in parallel with our extensive EMC SAN, The University Hospitals of Leicester NHS Trust is maximising the value of information at the lowest possible cost. “This is a blueprint for EMC’s information lifecycle management. We are making critical information more productive across its entire lifecycle, managing information based on its changing value to the NHS Trust, and ultimately protecting more information more affordably. This real, practical archiving strategy will eventually hold up to 95 percent of the NHS Trust’s data storage, at one third of the cost of the EMC Symmetrix storage,” Remmer continues.



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Seamless scalability

Besides the lower total cost of ownership, there are a considerable number of other benefits in using EMC Centera—most notably scalability. The demand for fixed content information storage will be fuelled by all manner of sources: more innovative electronic scanning solutions, covering the heart, feet, and eyes; electronic blood pressure monitoring; and digital video of sleep disturbance patterns, for instance. Existing hard copy patient images need to be scanned. And the ever-present legislative requirement for storage will result in relentless growth. The petabyte scalability of the EMC Centera will cope effortlessly though. Its architecture means capacity can be slotted in quickly and easily, while it automatically discovers and configures the new capacity as it is installed.

The digitised image information is also totally protected in the EMC Centera environment. All information objects are synchronously mirrored within the local Centera cluster to support automatic recovery from component failures. The information is also backed up by EMC Data Manager to a Quantum P7000 LTO library. “This is a great step forward, when you consider that until now we have relied on up to 15,000 CDs to store patients’ heart images.”

Although patients may not immediately notice the difference, the centralised fixed content storage solution is also enhancing patient care. It enables patient images to be made available in seconds across the Trust, for accelerated—and more detailed—diagnosis. The secure information repository also prevents the calamitous chance that a patient record is inadvertently lost or destroyed. “We use admission wards for non-emergency care,” he says. “The flexibility of the EMC Centera allows us to conduct a rapid diagnosis and send the patient to the appropriate part of the hospital for treatment. This approach overcomes the problem of bed-blocking, improves the service we provide to patients, and assists in the goal of making the entire NHS Trust operate at peak efficiency.”

“This fixed content solution represents a quantum leap in storage technology,” Remmer concludes. “With minimal investment, we are achieving a real improvement in patient care. Patient images are continually available throughout the hospital network, using a cost-effective, powerful, and scalable solution. It is the ideal complement to our EMC SAN environment. These two intrinsic elements of the information lifecycle management solution help the Trust match service levels and cost to the value of information, protect information remarkably cost-effectively, optimise storage provisioning, and ensure critical patient image archives are always available.”

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