

Data Storage in Healthcare

The complex storage environment in healthcare requires a broad range of technical expertise as well as the negotiating skills of a diplomat and the steady hands of a surgeon.



IT professionals in industries like manufacturing and financial services comfort themselves with the knowledge that they don't have the complex storage environment problems that their counterparts in healthcare face.

The tsunami of data crashing onto the digital shores of healthcare providers today comes at them from scores of sources: clinical departments like radiology, pharmacology, and cardiology, Hospital Information Systems (HIS), Electronic Health Records (EHR), and Computerized Physician Order Entry Systems (CPOE), to name only a few. All of that data is inputted and accessed by a diverse range of users—from admins to doctors—who want immediate, secure access to everything from anywhere. Complicating things further, a high percentage of users served by a typical hospital IT department don't even work for the hospital.

Healthcare IT professionals not only have to contend with regulatory agencies that scrutinize every corporate procedure, but these IT professionals must also deal with the Healthcare Insurance Portability and Accountability Act of 1996 (HIPAA), which requires the privacy of a patient's electronic information and insists on a complete record of who looked at it (and when!) over the whole period of time it has been stored.

In fact, during the recent Health Information and Management Systems Society (HIMSS) exhibition, Logicalis Healthcare Solutions Business Development Manager Karen Burton observed that "security" and "regulations" were the two most frequently heard words on the show floor. Further, it is generally held that as much as half of the data associated with the typical hospital exists only on paper.

According to a recent study by Massachusetts General Hospital and George Washington University, less than 25 percent of all U.S. doctors use some form of electronic health records in their practices.

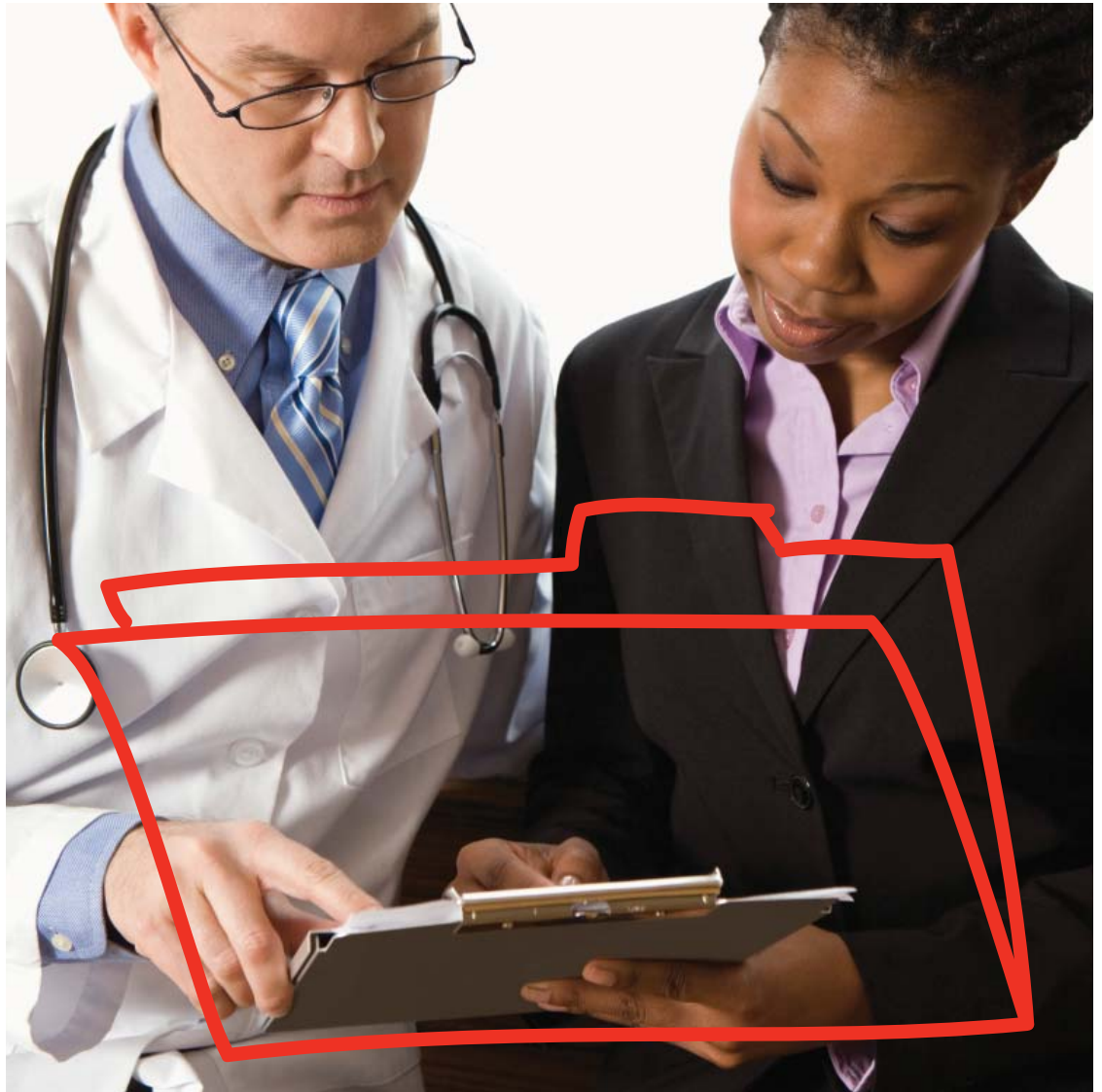
Getting to fully electronic medical records while providing the security and compliance for that data is among the key issues keeping healthcare IT directors walking the floor at night.

Oh, yes. And if a digital image of some critical organ of a patient in surgery suddenly becomes irretrievable, the patient could die. Very few other IT departments face stakes that high.

Given those high stakes and the opposing challenges of having digital versions of medical records be both readily accessible and absolutely secure, IT directors and their teams in healthcare can be forgiven for feeling as if theirs is the most stressful storage environment in the world of information technology.

Rising Tide of Data

There is no holding back the rapidly rising tide of data in healthcare. More and more paper records are being transferred to digital files. Digital imaging technologies are a medical breakthrough that enable doctors to non-invasively probe inside the human body, but the sheer volume of data that medical imaging generates is giving headaches to hospital IT professionals who have to figure out where to store it all. Digital mammography, for



example, regularly produces images that require four gigabytes of storage per study. Complicating the situation, regulations in many states require hospitals to keep all images that show a positive indication of cancer—forever. As a result, literally thousands of regional hospitals across America today are at risk of being overwhelmed by their own data.

Range of Expertise

Because of this complex array of technical and non-technical factors facing healthcare IT departments, few solution providers have the necessary range of expertise to help them with their escalating storage needs.

Clearly, just understanding the technology is not enough. To address the many issues facing healthcare IT professionals, Logicalis' Healthcare Practice provides a range of technical solutions balanced with years of hands-on experience in healthcare.

“The experience of our team members, their long-term relationships with healthcare executives, and their involvement in the healthcare community are our key differentiators,” says Logicalis Director of HP Storage Bobby Thomas.

Logicalis understands the broader needs of the healthcare infrastructure and offers solutions tailored specifically for healthcare storage environments, including the following:

- Medical Archiving Systems (MAS)
- Backup (disk-based and online)
- Business continuity/disaster recovery
- Consolidation and virtualization
- Email archiving

Because healthcare organizations also share many of the technology challenges of other industry segments, Logicalis' broad portfolio includes Unified Communications, Managed Services, Enterprise Computing, Business Information Management, and Application Services.



The Road to Replication

While hospitals have plenty of backup solutions for individual applications, many are on older tape and optical storage. Ideally, all hospitals would like to have a storage management strategy, including backup, archiving, and a business continuity/disaster recovery system with off-site fully mirrored replication. Given budgetary constraints and other issues, however, the space between what hospital IT departments have and what they want can be a long and winding road. Having traveled it many times at many different hospitals, Logicalis knows all of the incremental steps that can be taken along the way—without taking any detours that lead to expensive short-term fixes.

Tape backup by itself is no longer capable of meeting the data recovery requirements of hospital IT environments. Hospitals today have tens of terabytes of data, and the rule of thumb is that it takes about a day to restore each terabyte of data from tape. No hospital can be without its data for that long.

Most healthcare IT directors still have graphic images in their minds of what an actual disaster can look like from the news coverage of Hurricane Katrina. Those images, and hospitals' boards of directors, are applying constant pressure to migrate from what Logicalis Storage Consultant Chuck Gerstner refers to as the "dirt standard"—shipping reels of tape to an off-site vault every night in a pickup truck—to the "gold standard" of fully mirrored, automated, fail-safe off-site replication.

Gerstner uses two key considerations to determine the pace a hospital IT department needs to take to provide acceptable disaster recovery: recovery time objective (RTO), meaning how fast data must be recovered, and recovery point object (RPO), meaning how much data a hospital can afford to lose.

"The requirements vary by application," Gerstner says. Clinical patient care RTO, for example, should be measured in minutes or hours, but an acceptable RTO for payroll and general ledger could be a couple of days. Email falls somewhere in between. "One of the best things that hospitals can do to hold down cost is clear out their junk drawers," Gerstner adds, referring to all of the unstructured data that otherwise gets backed up and stored with the critical data.

Knowledge Base

Healthcare IT environments present a unique set of challenges to their IT departments but also share many of the same issues that face organizations across a broad range of industries. As part of the “Making IT Matter” series, Logicalis has produced several in-depth features that not only offer solutions to many of the problems that organizations confront today but also identify technologies that proactive IT departments can leverage to give their organizations a competitive edge.

The following features can be downloaded from the Logicalis Web site:

Consolidation and Virtualization

www.us.logicalis.com/cv/

Email Management and Archiving

www.us.logicalis.com/em

Unified Communications

www.us.logicalis.com/uc

Managed Services

www.us.logicalis.com/ms

Educational Process

The first thing Logicalis does with a healthcare client is discover and understand its RTO and RPO requirements for different applications. Often it’s an educational process for the hospital IT department as well. “The first thing everyone wants is to be able to restore everything immediately,” Gerstner says. “The next step is coming up with more realistic RTOs and RPOs that can be accomplished within the constraints of existing budgets.”

Once realistic recovery parameters are identified, Logicalis consultants work with the IT department to develop a tiered strategy that meets specific requirements and budgetary constraints.

“With the right tools in your bag, you can basically solve any kind of business problem that is presented to you with the economics that are dictated.”

- Greg Murphy,
Healthcare Veteran,
Logicalis Storage Consultant

“What you have to do is reverse-engineer the solution in line with the hospital’s economics in a phased way. The key is to not take any lefts when the ultimate direction is right. The end game is always fully mirrored business continuity/disaster recovery with replicated storage,” says Murphy.

There are many choices between virtualized synchronous mirroring, required for tier-one clinical applications that have to have some form of automated failover, and less expensive technologies for applications that can be recovered more slowly.

If tape backup is the first step, a good second step, Murphy says, is tiered storage with disk-to-disk backup. “You still have to have tape in the mix in the interim for off-site storage,” Murphy notes, “but by putting disk-to-disk backup in the middle, you get the fast recovery time that is not possible with tape.”

Many trade-offs can be made along the way to off-site replication. “If you don’t have a second location to use as off-site, we can still implement a second array with replication software and park it next to the first array.” Murphy provides an example. “That will give you fault tolerance and, if anything happens, you can be back up and running in 30 minutes. Then if you open a new wing or build a new hospital, you can pick up that array and move to the new location. In the meantime, you have investment protection: You are getting something from the first investment that you didn’t have, and you can leverage it when brick-and-mortar catches up.”



Holistic Approach

The key element in a healthcare storage strategy is a holistic approach that takes into account the current and future needs of the entire healthcare IT environment and enables an IT department to be proactive and prevent crises instead of always having to react to problems that could otherwise have been avoided.

This emphasis on prevention is fundamental to a comprehensive storage consolidation and virtualization strategy. The business case for consolidation is as compelling for healthcare as it is for any other industry. Hospital systems must keep costs down. They need to consolidate the number of servers and storage devices that have propagated through the systems' environments over the years. Hospital systems need to centralize and optimize management of their entire IT infrastructure. Storage consolidation and virtualization technologies promise all of those benefits and more.

Understandably, HIS vendors want to carefully control and isolate their application infrastructure to ensure performance, security, and support. This strategy delays adoption of consolidation and virtualization advances that are currently helping organizations outside healthcare get control of their storage environments.

The push-back on consolidation and virtualization by some software vendors ties at least one hand behind the IT department's back. In addition, Logicalis' Gerstner notes, having to maintain islands of applications and attached storage makes it increasingly difficult to enact policy consistently across the storage environment—a serious risk factor for conflict with HIPAA.

While many HIS vendors are still evaluating and certifying virtualization in their infrastructure, many storage options can be surgically implemented around them. Logicalis has worked with most of the large healthcare HIS vendors, for example, to provide virtualized storage without risking decer-

tification. It's a natural partnership: HIS vendors know their applications. Logicalis knows infrastructure. Logicalis has also collaborated with Picture Archiving and Communications System (PACS) vendors to provide archiving solutions for these vendors characteristically huge files.

Even where HIS support issues complicate server consolidation, storage virtualization holds the promise of providing centralized management of storage without impacting healthcare applications. Similarly, although clinical department heads are often very territorial, few go so far as to want responsibility for their own technical support. Virtualization of their storage would not intrude on control of their applications but would at least take storage off the department heads' list of responsibilities.

Complex Diagnosis

If technology were the only consideration facing healthcare IT departments today, that would be challenging enough. What makes the diagnosis for healthcare problematic are the other variables, including the assortment of regulatory bodies that want to dictate what gets stored and for how long, software vendors that want everything in a hospital done their way, and the radiology department that insists on a certain PACS for its lab without regard for compatibility with the hospital's IT infrastructure.

There may be no panacea for the challenges healthcare IT departments face, but Logicalis' experienced team has found that when you and your technology solutions partner understand all the variables involved, much can be done with the right technology, skills, and team.

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About Logicalis

Logicalis is an international provider of integrated information and communications technology (ICT) solutions and services founded on a superior breadth of knowledge and expertise in communications & collaboration, data center, and professional and managed services.

The Logicalis Group has annualized revenues of \$1 billion, from operations in the UK, US, Germany, South America and Asia Pacific, and is fast establishing itself as one of the leading IT and Communications solution integrators, specializing in the areas of advanced technologies and services.

The Logicalis Group is a division of Datatec Limited, listed on the Johannesburg and London AIM Stock Exchanges, with revenues in excess of \$4 billion.

What can we do for your organization?

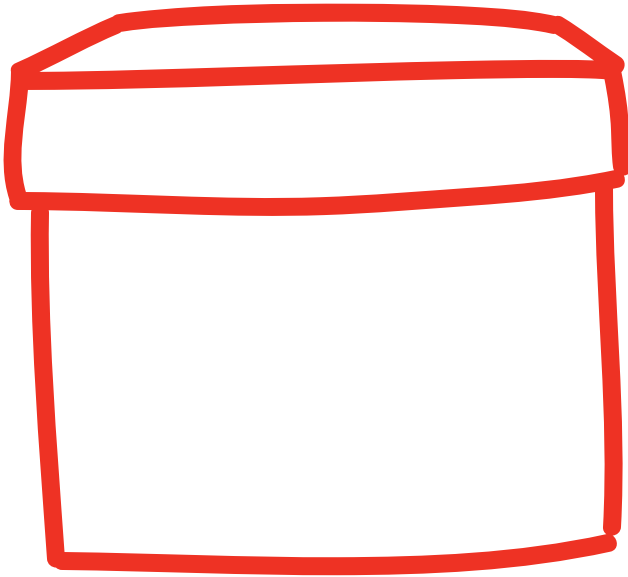
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