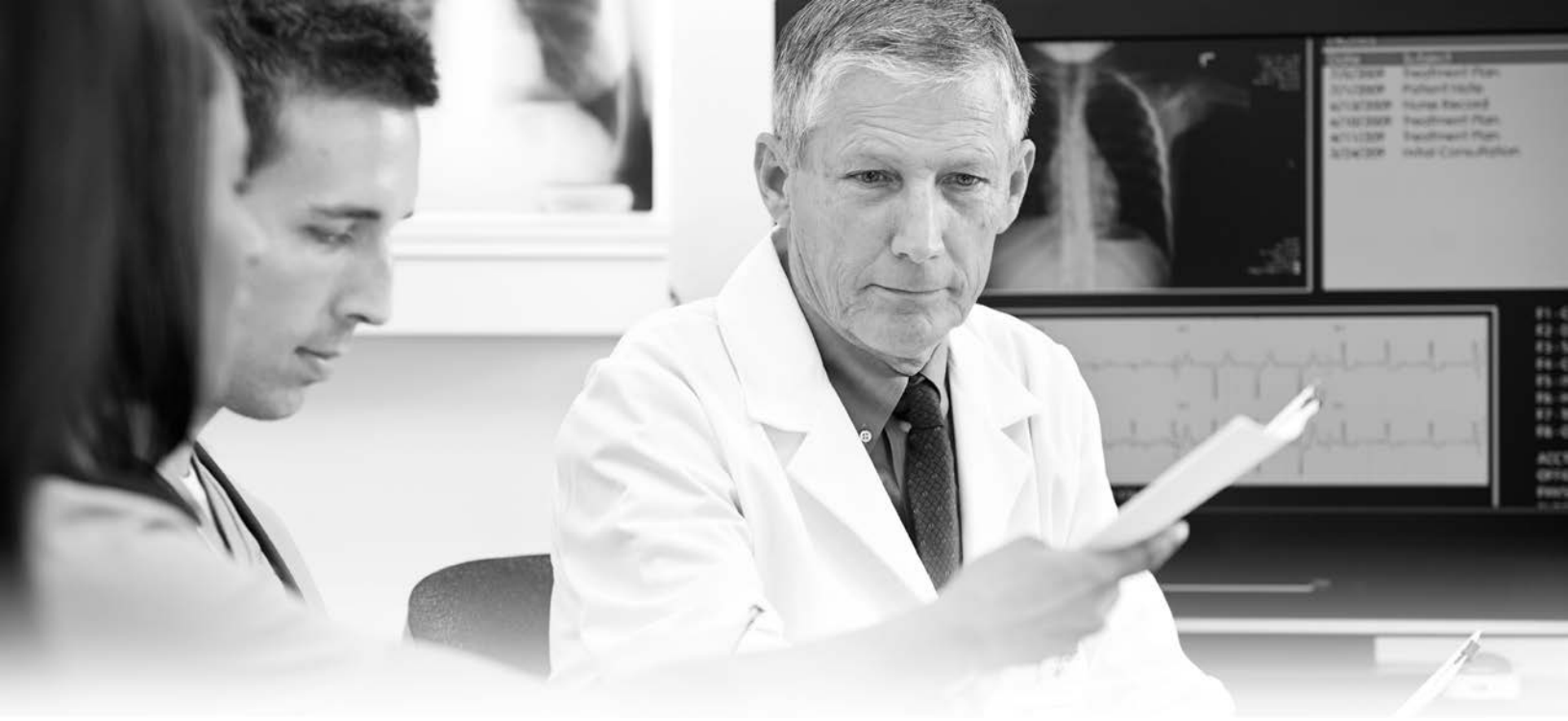

IMPROVING HEALTHCARE DATA MANAGEMENT

Beyond silos: meeting the data management challenge

EMC PERSPECTIVE

EMC²

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The difficulties with siloed medical storage

Most healthcare organizations dedicate specific PACS storage systems to each of their diagnostic disciplines. This can create certain difficulties:

- Dedicated storage creates multiple storage silos, which can inhibit data sharing across modalities and make storage management more complex.
- Storage silos reduce utilization rates and increase the inefficiency and cost of data management.
- Storage silos inhibit the collaboration between departments required for accurate diagnostics and the development of comprehensive treatments.

A DELUGE OF DATA

Managing the volume of data that is now a regular part of daily healthcare management operations is a growing challenge. In the next four years, EMC® estimates the amount of stored medical image data will grow from 0.8 exabytes to nearly four exabytes. The amount of data managed will continue to grow as healthcare organizations add new equipment and incorporate data-intensive next-generation diagnostic tools into standard protocol.

Healthcare data is typically housed on siloed systems based on department usage or specific function, such as radiology. This “siloing” creates complexity; each storage system must be managed separately, which makes data more difficult to search or share, and which reduces storage utilization efficiency.

EMC Isilon® scale-out NAS storage simplifies healthcare data management with a single file system that manages data as a single pool of storage. A single file system reduces management complexity and increases storage utilization rates. EMC Isilon solutions work with all major picture archiving and communications systems (PACS), ISV applications used to store medical imaging data, and they easily scale at the push of a button to meet growing storage needs.

TRENDS DRIVING A NEED FOR CHANGE

Several factors are forcing healthcare organizations to rethink their storage strategies:

More data to store: Storage capacity requirements continue to grow significantly with the shift to data-intensive digital images for X-rays, ultrasounds, and other diagnostic instruments, and with the increased use of diagnostic tests in general. As the number of storage devices increases to support the rising volume of data, so too does the need for IT resources to maintain the growing systems.

Inefficient use of storage capacity: In most healthcare organizations, storage is typically managed by diagnostic function or department. Each piece of equipment has its own PACS with associated storage, which leads to the creation of multiple storage systems requiring independent management throughout an organization. Since capacity is not shared between modalities, this independent management of PACS storage systems constrains data sharing. For example, a typical CT scanning system may require multiple capacity upgrades over its lifetime, while a diagnostic X-ray system within the same organization may have capacity to spare. With a siloed system, extra capacity cannot be shared, and efficiency is lost. The inability to share surplus capacity between functional areas regularly leads to healthcare storage utilization rates well under 50 percent. Siloed resources also lead to increased storage management costs, complexity, and inefficiency, which causes healthcare organizations to buy more storage than necessary to meet the demands of different groups.

Changing data retention requirements: Patient records, clinical study results, and medical diagnostic images are now stored for longer periods of time. Additionally, state and federal data retention requirements continue to increase. While some data may be appropriately archived to tape, most stored healthcare data needs to be immediately accessible online. As more multidisciplinary and personalized treatments are introduced, healthcare organizations will need to ensure extended access to shared data, especially as the cost of lost data is so high.

Emerging diagnostic and therapeutic fields that generate vast volumes of new data: The adoption of new diagnostic imaging techniques and tools also increases the generation of large volumes of data. Many healthcare organizations are experiencing a rise in digital pathology and microscopy. The addition of sleep studies involving

video surveillance data, and the incorporation of next-generation sequencing (NGS) and proteomics to customize disease treatments further extend the volume of data. Equipment associated with these new fields can produce unprecedented volumes of data: for example, a typical NGS study can create an additional 100 to 200 gigabytes of data per study, per patient. Current siloed storage infrastructures will not scale to meet this expanding data management demand, and costs and complexity will continue to rise.

INFRASTRUCTURE MANAGEMENT COMPLICATIONS DUE TO DATA GROWTH

To keep pace with the explosion of data, many healthcare organizations simply add raw capacity with the purchase of dedicated storage for each new piece of equipment. Unfortunately, while this provides disk capacity for individual diagnostic tool data, it creates another siloed set of data repositories. Creating siloed storage adds more rack space, more electricity and cooling, additional backups, and separate management of each data volume. In most cases, this means running systems at low utilization rates, which translates to increased cost and management complexity.

Tight IT budgets may strain matters further, as healthcare organizations find themselves with budgets unable to support increased storage needs. With siloed storage, costs and management duties increase as more devices are added, forcing IT staff to divert time and resources ordinarily spent on other projects. IT staff time is now dedicated to storage management instead of growth, and CAPEX and OPEX increase.

SEEKING A SOLUTION

Healthcare organizations need a unified storage solution that is highly scalable and highly efficient, one that is able to meet the requirements of multiple modalities, while offering price/performance-tiered storage that supports multidisciplinary computational workloads. EMC Isilon scale-out NAS storage offers healthcare providers a path to simplify data management, increase storage utilization, and achieve leading scalability.

EMC ISILON SIMPLICITY, SCALABILITY, AND BEST-IN-CLASS PERFORMANCE

EMC Isilon solutions are already used in leading healthcare organizations around the world, providing N+4 data protection and a single pool of storage that offers utilization rates over 80 percent. As the requirements of the provider increase, the EMC Isilon storage pool easily scales at the push of a button to meet future storage needs, providing investment protection. EMC Isilon hardware platforms are designed for simplicity, value, and best-in-class performance. EMC Isilon systems currently can scale-up to support 20 petabytes of storage capacity, to over 100 GBps of throughput, and up to 1.6 million SPECsfs file operations per second in a single file system.

Every EMC Isilon solution can seamlessly scale on demand, enabling the healthcare organization to add hundreds of terabytes of storage or expand performance in minutes. At the same time, the modular Isilon architecture and intelligent software make deployment and management simple. Powered by its OneFS® operating system, every EMC Isilon cluster is a single pool of storage with a global namespace, eliminating the need to support multiple volumes and file systems. OneFS combines the three layers of traditional storage architectures—file system, volume manager, and data protection—into one unified software layer, creating a single intelligent file system that spans all nodes within a cluster. Unlike simple NAS namespace aggregation products, the EMC Isilon OneFS operating system is truly distributed and intelligently stripes data across all nodes in a cluster to create a single, shared

pool of storage. OneFS offers unsurpassed mission-critical reliability and industry-leading drive rebuild times.

OneFS also delivers unique cluster-aware symmetric multiprocessing (SMP) capabilities that enable the system to move tasks between processors for extremely efficient workload balancing. In conjunction with the OneFS ability to stripe data across all nodes in a cluster, EMC Isilon achieves the high-aggregate bandwidth performance required to power next-generation healthcare data centers.

As healthcare data is now retained for longer periods than ever before, more data is managed online on different storage tiers based on each data type. To simplify management, EMC Isilon offers a single file system with automated data migration between multiple tiers.

EMC Isilon also offers the industry's first suite of scale-out storage data management applications to meet critical data protection, access, management, and availability requirements now essential to healthcare data management. Three applications that are particularly relevant to healthcare are the SyncIQ®, SmartPools®, and SmartLock® applications, which provide data replication, auto-balancing, auto-tiering, and data protection capabilities.

Application	Purpose	Description
SyncIQ	Data Replication	Replicate and distribute data sets to multiple shared storage systems in multiple sites to provide a reliable disaster recovery capability, compliant with healthcare needs
SmartPools	Resource Management	Implement a highly efficient, automated tiered storage strategy to optimize storage performance and costs
SmartLock	Data Retention	Protect your critical data against accidental, premature, or malicious alteration or deletion with our software-based approach to write once read many (WORM)

MOVING BEYOND SILOS TO BETTER HEALTHCARE DATA MANAGEMENT

The combination of EMC Isilon hardware, single file system, and OneFS management software delivers the performance needed to meet the growing data challenge facing today's healthcare organizations. The Isilon solution simplifies storage management, while providing the robust data protection, high utilization rates, and lower operating costs essential to successful healthcare data storage management.

CONTACT US

To learn more about how EMC products, services, and solutions can help solve your business and IT challenges, contact your local representative or authorized reseller—or visit us at www.EMC.com/Isilon.