IT INFRASTRUCTURE

2005 COMPUTERWORLD HONORS CASE STUDY

MEDICINE

INNOVATIVE TECHNOLOGY HELPS HEALTHCARE PROFESSIONALS IMPROVE COMMUNICATION AND INFORMATION SHARING, CREATE OPERATIONAL EFFICIENCIES AND INCREASE SAFETY BY PROVIDING A TIERED STORAGE INFRASTRUCTURE FOR INCREASED PERFORMANCE AND FLEXIBILITY, MORE EFFICIENT DELIVERY AND MANAGEMENT OF IT SERVICES, AND ASSURED AVAILABILITY OF BUSINESS-CRITICAL CORPORATE APPLICATIONS. [20055354]

SUMMARY

Cerner Corp. is passionate about transforming healthcare through the innovative application of information technology and is committed to maximizing the efficiency and responsiveness of its organization to deliver the product capabilities healthcare providers need to treat and manage those in their care. The company’s flagship solution, Cerner Millennium®, helps healthcare professionals improve communication and information sharing, create operational efficiencies and increase safety. Cerner’s hospital clients depend on Millennium to deliver the highest quality care to patients. To achieve this objective, the company developed a tiered storage infrastructure for increased performance and flexibility, more efficient delivery and management of IT services, and assured availability of business-critical corporate applications.

APPLICATION

Cerner Corp. is a leading supplier of healthcare information technology solutions and services, with nearly 1,750 Cerner Millennium software applications in production around the world, helping healthcare professionals run tests, make diagnoses, fill medications, administer care and remit bills. Cerner’s core mission is to fundamentally transform healthcare through information technology—to improve care at every level by enabling physicians, nurses, pharmacists, administrators, and laboratory and radiology technicians to collect, share and intelligently display critical information where and when it is needed.

As a provider of clinical software to hospitals, Cerner understands the importance of having both a flexible, efficient IT infrastructure and a sound business continuity strategy. Because lives depend on its products and services, Cerner is using the most advanced technology in the industry to enable information lifecycle management (ILM). With an ILM strategy, Cerner matches performance and data availability requirements with the most appropriate storage tiers and uses advanced software for centralized, reliable data management. The result is improved communications, collaboration and information sharing that drive every aspect of the business—from product development to customer support. A more productive and efficient workforce is better able to meet the needs of healthcare providers, ultimately affecting tens of thousands of people in hundreds of hospitals around the world.

A large majority of Cerner’s ILM infrastructure is based on three tiers of 350 terabytes of EMC storage and advanced EMC software. Business-critical tier one applications are stored on high-end EMC Symmetrix DMX networked storage. Tier two applications, such as file serving, development and certifications, utilize less expensive EMC CLARiiON storage, accessed through an EMC Celerra network-attached storage (NAS) gateway. In addition, Cerner uses EMC CLARiiON ATA disks and software for backup-to-disk to speed backup and restore processes. Tier three data includes email archives, which are stored on EMC Centera content-addressed storage (CAS). This data is also replicated locally using EMC business continuity software.

Cerner’s ILM infrastructure has allowed the company to improve performance, reduce administration costs, and simplify backup and recovery routines. In addition, the company is able to use the ILM infrastructure to support its Vision Center sales tool, which enables Cerner sales professionals to demonstrate the performance and reliability of Cerner Millennium to prospective clients by way of in-person demonstrations and interactive displays.

With a tiered architecture and by embracing ILM, Cerner is able to provide highly responsive and cost-effective IT services supporting critical business applications. As a result, Cerner is able to maximize associate productivity and efficiency to better serve the needs of its hospital clients, while protecting
information assets and gaining the greatest value from its storage investments.

BENEFITS

Cerner’s ILM infrastructure is enhancing the productivity and efficiency of its corporate users and IT staff. As a result, Cerner can better use information to drive product innovation and responsive service to better support the needs of hospital clients.

Cerner associates rely heavily on tier one applications such as the Microsoft Exchange email application for internal communication and collaboration, as well as external communication and information sharing with clients. Without email, the company simply can’t function. In addition, Siebel Customer Relationship Management (CRM) is critical for managing client needs and facilitating new sales. Peoplesoft Finance and Human Resources applications are also essential to support associate needs. And Oracle, DB2 and SQL databases provide additional critical functionality to support the company’s information needs.

Using the same storage infrastructure and software that supports Cerner’s corporate applications, Cerner sales professionals simulate the performance and recoverability of Cerner Millennium solutions with the company’s Vision Center demonstration software. Every day, Vision Center generates and reports upon sample patient data managed within the high-performance ILM infrastructure, helping Cerner build trust with its hospital clients and increase sales of its software solutions.

Cerner’s ILM infrastructure allows optimal use of data to improve communications, collaboration and information sharing. The architecture is also facilitating a dramatic increase in application performance, which directly affects the speed with which Cerner’s associates can access and analyze data to perform their jobs. As a result, every group within the business—from product development to customer support—can perform with higher quality and greater responsiveness. Cerner is thereby able to deliver the Millennium solutions that healthcare providers rely on to treat and manage tens of thousands of people in hundreds of hospitals around the world. In addition, by using content-addressed storage to securely archive e-mail data, Cerner is able to meet information retention requirements, while providing rapid access to support ongoing healthcare services.

In addition, the ILM infrastructure allows the Cerner IT organization to deliver these benefits in the most cost-effective and flexible manner to maximize bottom-line value to the company. Cerner has significantly reduced costs by consolidating its corporate data and sample patient data on an EMC ILM infrastructure and simplifying administration of EMC storage using EMC ControlCenter software. Using this approach, Cerner has reduced training requirements and can leverage individual knowledge to manage more services in less time and at lower cost. By using ControlCenter, the company is able to manage its entire EMC storage infrastructure from a single viewpoint, to maximize performance, provision new services on demand, and manage backup and recovery processes efficiently and cost-effectively.

As a primary goal, Cerner plans to employ long-distance replication of its email archives as well as backup-to-disk to ensure rapid recoverability and 24x7 availability of information. Cerner is also in the process of extending business continuity to replicate tier one data between its primary datacenter and the remote disaster recovery site 28 miles apart. The company has set recovery time/recovery point objectives for all of its most critical data at four to six hours with zero data loss, and has put the building blocks in place to achieve those objectives.

Chris Conner, Global Resource Information Delivery Senior System Architect for Cerner, said: “Our hospital clients view Cerner as a leader in healthcare automation and also expect us to be a leader in the way we employ technology to run our own business. This tiered architecture ensures that Cerner associates have the capabilities they need to serve our clients with great efficiency and responsiveness, and to deliver products and services that support the highest levels of excellence in the healthcare industry.”

IMPORTANCE

Information technology plays a central role in making this project a success. Tiered storage is central to enabling an ILM strategy, which allows Cerner to match application requirements to the most appropriate tier of storage and gain centralized, reliable data management.

Cerner has consolidated its tier one business applications on a single high-end Symmetrix system to
gain significant performance and efficiency advantages. In addition, the ability to define security and access settings supports Cerner’s processes for complying with federal regulations, such as HIPAA and Sarbanes-Oxley.

EMC Celerra network-attached storage (NAS) technology provides a gateway for hundreds of Cerner’s tier two Intel servers to access shared storage on a CLARiiON system. NAS technology allows Cerner to eliminate the need for separate file shares associated each server and instead provide external storage for all of its distributed Intel servers on a single device. As a result, storage management is greatly simplified and recovery time is significantly reduced.

Centera’s CAS technology is also a key part of the ILM infrastructure, providing archiving of e-mail data for secure, long-term retention.

In addition, storage management software plays a significant role in simplifying administration, speeding storage allocation and performing backup routines. ControlCenter provides the technology that allows the company to manage the entire infrastructure from a single administrative viewpoint. The result is reduced administrative time and cost.

To achieve its business continuity goals, Cerner stores up to two weeks of data on CLARiiON ATA disk to ensure immediate availability in the event of a disaster. EMC TimeFinder software is used to create instantaneous snapshots of Cerner’s production data stored on Symmetrix systems for backup. Cerner also replicates its e-mail archives between local Centera systems and plans to implement long-distance replication to the company’s disaster recovery site 28 miles away.

In addition, Cerner is implementing continuous mirroring between its Symmetrix DMX systems at the primary data center and one at the disaster recovery site, using EMC SRDF and TimeFinder software. The expanded business continuity infrastructure will provide recovery time and recovery point objectives of four to six hours for the company’s most critical tier one applications. This solution will not only provide rapid recovery in the event of a physical loss, but also for logical disasters, such as data corruption—eliminating the need to have multiple disaster recovery solutions as is typically the case.

Cerner also used EMC Services for ILM storage assessment, data migration, and implementation to help speed the build out of the new infrastructure and ensure a successful outcome.

**ORIGINALITY**

Many companies attempt to be on the leading edge of technology, but few get there due to a cautionary corporate culture or other restraints. Cerner has taken a very aggressive stance in its IT strategy, challenging all of its key technology partners to deliver on the capabilities they claim to have. By challenging EMC to live up to its claims and deliver ILM capabilities in a secure, tiered storage environment, Cerner is achieving its business goals of improved performance and availability to support hospital customers.

Conner said, “Because our clients are so valued to us, we want to make sure we’re leading the way to provide them with the best possible healthcare technology and services possible. Through committed partnership with innovative industry leaders like EMC, I’m confident that we can achieve that goal.”

**SUCCESS**

Cerner’s ILM strategy and EMC infrastructure is in full production. It is delivering significant performance improvements at every level of the infrastructure and supporting the company’s business continuity objectives.

With increased performance, Cerner associates are experiencing improved communications, collaboration and information sharing to support every aspect of the business—from product development to customer support. This capability is allowing the company to deliver healthcare products and services with greater productivity and efficiency. In addition, Cerner’s IT staff has been able to reduce costs significantly by centralizing management of its storage infrastructure and utilizing ILM to match the most cost-effective storage tier to support the performance and availability needs of business users.

In the area of business continuity, the company has already deployed sophisticated replication and
backup strategies across multiple tiers of storage. Cerner soon will extend long-distance replication to its core applications, thereby achieving recovery time/recovery point objectives for all of its most critical data at four to six hours with zero data loss.

By increasing the productivity and efficiency of its staff, Cerner is better able to deliver the innovative Millennium solutions healthcare providers need to treat and manage people in their care. Ultimately, Cerner’s solutions affect tens of thousands of people in hundreds of hospitals around the world.

DIFFICULTY

When taking an aggressive approach to technology, it is not uncommon to meet some limitations on capabilities that are at the very leading edge of the industry. By working closely with its technology partners, Cerner was able to guide refinement of the technology to obtain the functionality expected. In some cases, the broader vision can overlook issues. In these cases, Cerner resources were able to develop spot workarounds. Despite the natural challenges expected in such a cutting edge project, Cerner has been able to move forward with a technology solution that is unmatched in the healthcare industry.