



Austin Radiological Association

Austin Radiological Checks-in EMC for Faster, Lower-Cost Backup and Recovery

BUSINESS VALUE HIGHLIGHTS

Profile: Austin Radiological Association (ARA), the largest provider of medical imaging services in central Texas, owns and operates 14 outpatient imaging centers and provides professional services to 15 hospitals. Its extensive services cover all aspects of medical imaging, including x-ray, MRI, CT, PET/CT, nuclear medicine, mammography, and bone density. ARA's physicians are all board-certified radiologists, many of which have fellowship training in areas such as pediatrics, musculoskeletal, nuclear medicine, neuroradiology, neurointerventional radiology, and vascular interventional radiology.

Challenge: The company's rapid growth in recent years was placing heavy demands on its information resources and straining its business continuity capabilities.

Business Value: EMC Services worked with ARA to design, plan, and implement a tiered storage infrastructure that integrates remote replication, backup, recovery, and archiving, as well as overseeing relocation to a new data center. As a result, ARA has:

- Reduced backup time from four days to 30 minutes due to new backup procedures and off-loading of older PACS data from production storage to a disk-based archiving solution;
- Improved RTO by being able to recover from a major failure in two hours compared to a full day;
- Slashed exposure to data loss from between one and four days to under one minute, thereby enhancing its RPO; and,
- Extended the value of its business continuity investments by utilizing a remote data center for application testing and development.

SOLUTION SNAPSHOT

- **Primary Applications:** Fuji Synapse PACS, RIS, Microsoft Exchange, Oracle.
- **EMC Software:** SRDF/A, TimeFinder/Snap, DiskXtender®, PowerPath®, EMC ControlCenter®
- **EMC Storage Infrastructure:** 120 terabytes of EMC content-addressed and networked storage, including EMC Symmetrix DMX™ 1000, EMC Centera™ Governance Edition and Centera Compliance Edition Plus systems
- **EMC Services:** Planning, design, and implementation services covering backup, recovery, archiving, and replication and data center migration
- **Environment:** Windows NT, Oracle

Austin Radiological Association (ARA), the largest provider of medical imaging services in central Texas, owns and operates 14 outpatient imaging centers and provides professional services to 15 hospitals. Reliable access to X-rays, patient records, and other medical information is crucial to both ARA's reputation and the care of its patients. But the company's rapid growth in recent years was placing new demands on its information resources and straining its ability to adequately protect data.

To address this situation, ARA turned to EMC to update the company's backup, recovery, archiving, and long-distance data replication capabilities. The results are impressive, including reducing backup time from four days to 30 minutes, shortening recovery-time objective from days to hours, as well as significant staff time savings related to backups. EMC's backup, recovery, and archiving solutions also facilitated information lifecycle management (ILM) by automating the movement of older data from online, production storage to a more cost-effective disk-based archive.

“With EMC's range of solutions and expertise in business continuity, EMC was able to deliver a tiered protection strategy that truly integrated our data replication, backup, and archiving. We now appreciate more than ever that a business continuity solution for one data set may not be the right one for a different data set or even the same type of data that occurs at a different point in time. Since our infrastructure now takes these nuances into consideration, we have been able to dramatically improve the availability of our data while reducing the costs to protect it.”

Todd Thomas, Chief Information Officer

Todd Thomas, ARA's Chief Information Officer, said, “Quite simply, we were not willing to risk losing medical information or jeopardizing patient care as the company grew. The cost of a total systems failure is high—on the order of tens of thousands of dollars per hour. Our former backup and recovery systems were not providing the protection we needed and the cost of managing them was growing exponentially because processes were not integrated or automated. We believed that there had to be a more cost-efficient and effective way to protect our fast-growing information resources.

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More rapid and successful implementations with EMC Services

ARA's development of a new infrastructure was set into motion during the evaluation of a related project that would shift the company from hard-copy film to digital imaging. On assessing the changes that were needed, it became apparent that ARA's existing tape backup systems would not scale to protect the amount of data that ARA projected would be generated in a filmless environment. Converting patient films to digital images brought to the forefront concerns over data archiving, long-distance replication for business continuity, and consistent data availability.

ARA called on EMC® Services to transform its infrastructure. EMC Services provided ARA with a full range of professional planning, design, and implementation services, as well training for ARA's IT staff.

Jack Yudell, ARA's Data Center Manager, said, "Business continuity solutions are so complex, there's no way a typical customer could implement them without help. For example, we struggled with backup windows that were threatening to overtake our production processing. As we moved from our old processes to the state-of-the-art systems we have now, EMC Services was able to suggest the right solution for every problem, help us implement it, and provide any needed training.

"EMC Services allowed us to accomplish our goals more quickly and successfully than we could have on our own or even with another vendor. EMC Services' knowledge and expertise in replication, backup, and recovery are exceptional."

ARA and EMC Services implemented the new enhancements in a phased approach that included deploying disk-based data archiving, changing from tape to disk backup, improving recovery-time objectives (RTOs) and recovery-point objectives (RPOs), boosting remote location productivity and migration to a new data center.

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EMC active archive lowers costs, facilitates rapid growth

Before implementing a new disk-based archiving solution, ARA's online production storage for its Fuji Synapse Picture Archiving Communications System (PACS) was growing rapidly. The PACS was generating 20 gigabytes of diagnostic images every day, reducing the amount of available high-performance primary storage for other applications. The results were an enormous amount of unchanging image data sitting on the production systems and a reduced capacity for growth.

For ARA, the solution was an easy one. The company now relies on EMC DiskXtender® software to automatically migrate PACS images that are more than 30 days old—as defined by operational protocol—from EMC Symmetrix® storage to EMC Centera™ Governance Edition (GE) and Compliance Edition (CE) Plus purpose-built archival systems.

"We've completely innovated how we handle PACS data," explained Yudell. "Today, we're moving 20 gigabytes a day onto Centera. That keeps production capacity open for the ongoing flow of new PACS data and ensures a steady state of two terabytes of digital images on Symmetrix storage. Centera, on the other hand, holds about 27 terabytes of PACS data and is growing at nearly six terabytes a year. With this strategy, our physicians gain immediate access to both recent and historical patient records, enabling timely and safe care decisions."

Thomas noted, "Tiered storage has delivered huge cost savings while providing for more reliable protection of our PACS data. Disk consumption on the Symmetrix systems has leveled out and has increased on the Centera archives. That's exactly the model we were going for. We're spending far less on more expensive production storage than we would have without Centera. And we can easily accommodate PACS growth even as our business continues to expand."

“For our patients, the value of providing fast and reliable access to older medical records and radiology images is incalculable. In fast-moving emergency room situations, clinicians can now pull up patients’ past medical records from Centera very quickly.”

Centera also allows ARA to meet HIPAA and other government regulations for patient record retention and availability, according to Yudell. “Our old tape archiving procedures were simply too cumbersome, slow, and unreliable to fit the bill. Utilizing the Centera Compliance Edition Plus, we have a truly cost-effective, state-of-the-art strategy to enable compliance regulations for patient data.”

Cutting production backup from four days to 30 minutes

Previously, ARA’s production systems were backed up to a single tape drive at the primary data center. It was a cumbersome process that could take up to four days.

Thomas explained, “As we evaluated moving to digital PACS and projected significant increases in data to back up, we felt our tape processes would become more inefficient and threaten our ability to provide optimal patient care. With tape, server restorations could take hours, backups took days, and often we ran into data corruption on the backup tapes. We were not comfortable using this system to begin backing up digital patient images.

“Bringing in EMC’s Symmetrix DMX systems reduced the amount of time required to do our backups,” he added. “And given the rate our PACS environment was growing, the addition of Centera to off-load large amounts of data to the archive meant our backup times were further reduced.”

But ARA didn’t stop there. In addition to tackling historical PACS backups, ARA also focused on improving the efficiency of backing up current PACS data as well as Radiology Information System (RIS), Microsoft Exchange, and Oracle-based applications for accounting, human resources, and other business functions. To achieve this, ARA took tape out of the equation altogether and now uses EMC TimeFinder®/Snap software to create internal snapshots that reside on Symmetrix.

ARA also retains a copy of all current PACS, RIS, Exchange, Oracle, and other critical information in a separate location using EMC Symmetrix Remote Data Facility/Asynchronous (SRDF®/A) software to replicate from a Symmetrix system at the primary data center to another Symmetrix at the secondary site. Historical PACS data in the Centera archives is replicated in the same way using Centera replication software.

“We’re now replicating PACS images and backing up non-PACS applications in 30 minutes or less compared with four days,” said Yudell. “Even though we typically back up 13 terabytes—including databases, snapshots, boot drives, and logs—we can back up more often and with very little effort.”

Dramatic RTO and RPO improvements

Before implementing the EMC solution, ARA had not fully defined its recovery-time objective (RTO), that is, the amount of time it takes to bring the business back online after an outage. “It was just ‘do it as fast as you can,’” Yudell said. “And because our backups were conducted less frequently, we were exposed to potentially significant data loss if a failure occurred.

“With EMC, we’ve made dramatic headway with our recovery-time objective since we can now restore our production site in hours compared to what used to take between one and four days,” he added. “In addition, because we replicate our production data asynchronously using SRDF/A, we’ve cut our exposure to data loss—or recovery-point objective (RPO)—from days to minutes.”

The ability to create groups of applications to maintain consistency within SRDF/A replications also provides ARA with enhanced levels of failover protection and flexibility. Everything within a designated SRDF/A group fails over at once with the execution of a single command, so all volumes in a group maintain consistency with each other. This allows ARA to create groups of servers—all PACS or all RIS servers, for example—and then fail over just those specific groups.

“Previously, it was all or nothing,” explained Yudell. “Now, in the event of a problem, we can fail over just PACS, Exchange, or other key applications. We can work the most critical applications first, and then the other data in order of its importance.

“Since we implemented EMC, our applications have basically been 100-percent available. It’s something we appreciate every day in our patient-centric environment. And while it would be unusual for our data center to suffer major damage, we know that with EMC, we are prepared for those situations.”

Business continuity capabilities boost productivity of remote data center

The same business continuity capabilities ARA has used to better protect its information infrastructure have also added value to ARA’s application development and testing.

Yudell explained, “With SRDF/A, we maintain a copy of our production data at our remote location for immediate failover and business resumption. Then, by simply adding TimeFinder/Snap we are able to create copies for testing and development work. Since we can create consistent point-in-time snapshots without taking the database offline, we can run tests against a copy of the current database, wipe it, then restore the snapshot, then test it again, and all without affecting performance or availability of our production systems. It’s saved us a lot of downtime, and there’s no impact on our users. Making our data versatile and multi-functional with TimeFinder/Snap allows our EMC business continuity investments to go a lot further.”

EMC smoothes move to new data center

Although disasters can happen at any time and without notice, ARA actually faced one source of potential problems that was completely expected: rebuilding their primary data center at a new location.

“We had totally outgrown our primary site, and there was a lot of concern about losing data or services during the shift to the new, expanded data center,” Thomas said. “In our planning, we made it clear that we couldn’t tolerate any interruption of more than a few hours, with zero data loss. We were confident we could meet those goals because of our EMC business continuity solutions.”

ARA found that their new EMC infrastructure was ideal for smoothing the transition to the new data center. With SRDF/A, ARA was able to replicate database applications such as the PACS without any delay in communication between the two sites. It also made very efficient use of bandwidth, so there was less impact on applications and better availability.

“We executed the move incrementally, without having to take the whole system down at any one time,” explained Yudell. “We used SRDF/A to move the production data to the new primary site. Application moves were scheduled to minimize service interruption to users and the results were better than we’d hoped for. In fact, the only system downtime was the time involved in turning off a server at the old site, turning on a server at the new site, and installing the needed drivers on the new servers. Once the application was back online, the end-user experience was actually improved due to the enhanced hardware and network infrastructure at the new location.”

Thomas noted that EMC Services was instrumental in planning, designing, and implementing ARA's transition to the new data center. "The entire move was one of the smoothest operations I've ever seen. I've worked with a lot of project teams, and many of them talk about change control, the importance of working as a team, and the need for the customer to approve the work every step of the way. EMC is the only vendor services group I've worked with that actually takes those mantras seriously."

Business continuity strengthens customer relationships

The changes in ARA's IT infrastructure over the past five years have been unprecedented—moving from a tape-based environment to one that fully integrates disk-based backup, recovery, archiving, and replication across multiple tiers of storage and applications.

Thomas commented, "The value that EMC business continuity has brought to our organization is enormous. All you have to do is look at how quickly and easily we can back up or restore data, recover our applications, or fail over and recover our entire environment. While the importance of those changes has been huge to our IT operations, the real bottom line is improved patient care and clinical productivity. In addition to running our own radiology centers, we serve as an ASP (application service provider) by delivering outsourced services to a number of regional hospitals. With EMC, we're able to assure our ASP customers that patient data is protected and available for physicians and clinicians 24x7."



EMC Corporation
Hopkinton
Massachusetts
01748-9103
1-508-435-1000
In North America 1-866-464-7381

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Customer Focus

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