

USING BETTER STORAGE TECHNOLOGIES TO ELEVATE THE ART OF DIAGNOSTIC RADIOLOGY

A Nexsan Case Study of
Manhattan Diagnostic Radiology



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Twice the capacity at one half the price. Those kinds of numbers fundamentally change how diagnostic radiology centers serve their patients and improve patient care while lowering their overall costs to deliver their services. To recognize these benefits, some radiology centers are starting to use new, lower cost storage systems to store the increasing number of larger size, higher resolution images that the latest Magnetic Resonance Imaging (MRI) systems produce.

Ongoing improvements in MRI imaging technologies continue to provide radiologists with ever more detailed images of their patients. Images produced by the newest MRIs reveal nuances in shadow that better allow radiologists to determine precisely where a problem resides and better establish what the nature of the patient's problem is.

The hidden downside associated with using higher resolution images is that it requires more storage to house the larger image files that MRIs produce. Each two-dimensional cross-section or slice of tissue generated by an MRI produces an image that can range from hundreds of kilobytes (KBs) to megabytes (MBs) in size.

These increases in image size most adversely impacts the storage requirements for specialized diagnostic radiology centers like Manhattan Diagnostic Radiology (MDR) who generate many thousands of MRI images each day. Taking about 400 pictures for each study that they perform compared to 16 pictures for the average hospital, storage requirements for each MDR study can easily reach from 100 MB to 1 GB. MDR's IT Director, Joe Gomez, says, "We see on average about 300 patients a day so our radiologists need to create thousands of MRI images daily that consume anywhere from 3 to 300 GB of storage space daily."

To keep costs down, MDR used medical grade 9.6 GB DVDs to store archived data at a cost of \$18 per DVD. However not all DVDs could be stored in their Plasmon DVD jukebox and, with as many as thirteen doctors using the system at any one time, technicians had to retrieve needed DVDs that contained the images associated with archived case studies and insert them into the jukebox. These retrieval times could take anywhere from 15 – 30 minutes per DVD to complete.



These delays were negatively impacting the ability of MDR's radiologists to access and view patient studies and complete the diagnosis of their patients in reasonable amounts of time.

Belt and Suspenders

Recognizing this trend, MDR began to evaluate alternative storage methods for storing their archived case studies. Though they had twice looked at using disk systems in the past 36 months to store archived case studies, MDR again re-considered this option but this time expanded the scope of storage providers they were willing to entertain as potential candidates.

Features that MDR's Gomez did not wish to compromise on were the integrity or availability of the storage system. A self-described "belt and suspenders" type of guy and "EMC fan", Gomez knew disk prices had dropped dramatically but did not wish to risk bringing in another vendor's new storage system if it would in any way adversely affect the quality of service he provided to either his radiologists or MDR since he could not afford to lose any study's data.

While Gomez requested a bid from EMC, he also ventured out and requested a bid from Nexsan Technologies who he had heard about from an IT director at another diagnostic radiology center. Working with Nexsan channel partner RADirect on the bid, the quotes that he received back stood in stark contrast to one another. A 10 TB EMC CX300 storage array cost \$130,000 while a similarly configured Nexsan SATABeast storage array containing 21 TBs cost less than \$60,000.

“With the EMC systems, access time to imaging studies was between four and five minutes, but with SATABeast, access is now almost instantaneous. We’re getting better performance results at one-third the cost of EMC storage”

*- Joseph Gomez, IT Director
Manhattan Diagnostic Radiology*

For Gomez, Nexsan’s quote represented a significant savings that delivered twice the storage capacity of EMC. Recognizing that Nexsan would allow him to keep both his primary and archived data online while eliminating or at least minimizing the need for DVDs, Gomez still needed to compare the performance, availability and reliability of the SATABeast to his existing EMC system for his production data.

Kicking the Tires

To test the Nexsan SATABeast system, Gomez initially ran both the EMC and Nexsan storage systems side by side with the same production image files on both. Gomez’s users almost immediately witnessed a small percentage performance gain using the Nexsan Technologies SATABeast. Gomez says, “While 5 – 10% is not a lot, with 13 doctors accessing the system at the same time, even small incremental improvements in performance add up.”

Another concern of Gomez was the reliability of the disk drives used in the Nexsan storage system. Using the same SATA disk drives as found in many PCs, Nexsan’s use of these drives initially caused Gomez some concern about their reliability. But during testing and afterwards in production use, Gomez has not experienced a single disk drive failure.

Nexsan Technologies VP of Marketing, Brendan Kinkade, finds Gomez’s positive experience with SATA drives commonplace. Kinkade says, “Enterprise SATA drives now include 5 year warranties, are rated at over 1 million hours MTBF and share many of the design features and components of more expensive Fibre Channel disk drives. With the new generation of SATA drives we have seen overall failure rate of less than 0.5 percent across thousands of systems in the field”.

One unexpected benefit that Gomez realized when testing the SATABeast was its smaller footprint on MDR’s datacenter floor. Though this feature was not a

deal-maker, Gomez says, “In Manhattan, every square inch of space you save is valuable.”

The main problem that Gomez had with Nexsan SATABeast was that its cooling fans were very noisy – so much so that Gomez requested that Nexsan reprogram the storage system’s software to cause the fans to run more slowly to reduce the noise.

However once testing was completed and the technical bugs resolved to Gomez’s satisfaction, MDR made a complete switch from EMC to Nexsan for both their primary and archived stores of case study image files.

Elevating Diagnostic Radiology

The improvement in performance coupled with the availability of higher storage capacities has elevated the effectiveness of MDR’s diagnostic radiology practice. By keeping all production and the majority of archived images online, retrieval times for all images in a patient study are now often measured in seconds or minutes, thereby reducing the amount of time that doctors need to spend waiting for patient study images and allowing them to be more productive in their jobs.

“Nexsan’s SATABeast has met or exceeded all expectations thanks to excellent pre-sales and terrific technical support”

*- Joseph Gomez, IT Director
Manhattan Diagnostic Radiology*

Gomez says that the first Nexsan Technologies storage system he has purchased is already full but he plans to buy more. The money he is saving coupled with the additional capacity he is obtaining is allowing him to perform tasks he once only dreamed about. Short term he plans to buy more storage capacity for his production site and also set up a Nexsan SATABeast at an offsite location to mirror MDR’s data in real time.

All in all, Gomez has found Nexsan storage to be a perfect fit for MDR. Gomez says, “Bottom line, we are lowering our cost per study and able to store larger amounts per study. MDR, doctors and patients are now being better served because of this change in back end storage.” ■

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