PURESTORAGE®

Atlantic Health System has standardized on Pure Storage® solutions for all its mission-critical applications, increasing system responsiveness, cutting the demands on IT staff for storage management, and saving more than $1.3 million over six years.

BUSINESS TRANSFORMATION

Physicians and other clinicians have fast, reliable access to the information and applications they require to deliver outstanding patient care. Business analysts can perform their work faster and run more complex analyses, thanks to better access to greater volumes of data. And IT professionals can focus on high-value priorities without having to allocate key resources to manage complex legacy storage platforms.

REGION / COUNTRY

NAM / United States

INDUSTRY

Healthcare

"I'm proud to say we get reports from Epic that show we've had 100% availability since the day we installed Pure Storage."

Pat Zinno, *Director of Technology Services and Support*

ATLANTIC HEALTH SYSTEM STANDARDIZES ON PURE STORAGE TO DELIVER AWARD-WINNING PATIENT CARE

As medical record-keeping is now digital, the keyboard or tablet is as important a piece of equipment in the examining room as a stethoscope or blood-pressure cuff. Keeping those modern tools reliable and instantly available is the job of IT departments. And one of the most forward-looking of those departments is at Atlantic Health System (AHS), a non-profit New Jersey organization with five hospitals, over 1,600 beds and relationships with thousands of practitioners statewide. AHS has award-winning programs in numerous fields, including cancer care, stroke care, cardiology and heart surgery, and workplace environment.

"Our goal is to ensure that physicians are confident they will have instant access to the information they need, so they can spend more time in front of patients and not worry about the technology," observed Pat Zinno, Director of Technology Services and Support for AHS. To that end, he and his colleagues are constantly evaluating the systems that underlie AHS's IT infrastructure that deliver both patient-facing and business-oriented services.

When the decision was made to move to the Epic electronic health record (EHR) system, the team at AHS knew a lot of preparation would be required. And one critical area of preparation was the supporting storage infrastructure.

"Epic requires a very high level of storage performance," noted Meraz Nasir, Manager of Infrastructure Engineering at AHS. "You have to submit performance data to Epic on how your systems are performing, and they have very specific thresholds for measuring performance."

SEEKING A NEW APPROACH TO STORAGE

The impending move to Epic "was the right time to rethink our approach to storage," Zinno said. "We deployed Epic first in out-patient environments, but we knew that within a couple of years we also would have it in in-patient settings. This called for growing the number of end-users from less than 1,000 to around 16,000. We needed storage that could scale up to meet that demand without unnecessary costs, interruptions or management headaches. With a traditional spinning-disk environment, you run into a lot of issues when you add users, and we didn't want to get into that. So, we thought flash arrays would be a better fit."

After initially evaluating its incumbent storage vendor, AHS found a superior approach: Pure Storage.

"Performance was of course an important attribute we required," Nasir said, "but Pure Storage won us over with several other factors as well — the simplicity of

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>
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> *Manager of Infrastructure Engineering*

deployment and management, scalability, flexibility, and the Pure Evergreen™ Storage model. All of those were big factors in our decision."

That decision was not made lightly, however. "It wasn't easy for some of our team members to be convinced," Nasir recalled. "And I was skeptical myself at first. So, we started with a proof of concept (POC) trial, and the first thing I wanted to test was the resiliency of the Pure Storage array."

He added, "We wanted to know, can we take out a controller, can we take down the fabric and still have a seamless connection? And what we found was that when we did that, Pure Storage worked even better than all of the other contenders because the integration between Pure and VMware is so superior. The failure of the fabric was flawless, and that was a huge plus for us."

Another contribution to reliability and resiliency, the team found, was the architecture of the Pure Storage array. "One of the major challenges we had was with a non-native dual-pathing solution called PowerPath," Nasir said. "We always had major challenges with it, including its complexity and a lot of bugs. What Pure did was remove all the components between the server and the storage so that it's seamless. Pure just works better."

During the POC tests, "everything worked flawlessly, and the performance was always there," Nasir said. And what was the opinion of a former employee of a large storage vendor now on staff at AHS? "When he came in wearing orange socks, we knew Pure Storage was the choice."

PURE STORAGE QUICKLY BECOMES THE STORAGE STANDARD

AHS purchased four FlashArray//M70s to support the Epic environment. And the results have been even better than expected. "I am proud to say that we get reports from Epic that show we've had 100% availability since the day we installed Pure Storage," Zinno said. "They also show that in terms of system throughput, what we achieve between our two data centers is greater than what some customers do on just a single network."

Over a two-year period, Zinno said, AHS grew the number of users on its Citrix XenApp infrastructure running on Pure Storage arrays from less than 1,000 to around 16,000, "and we did that while maintaining performance across the entire platform, so that the user experience stayed consistent the entire time." Today, that number is close to 20,000, with around 7,000 concurrent users at any one time.

The XenApp environment is the primary platform for delivering Epic applications, so better performance in it impacts clinicians throughout AHS, both in its own facilities and at associated sites throughout the region.

BLAZING STORAGE PERFORMANCE IMPROVES BUSINESS DECISION-MAKING

The impact of Pure Storage on AHS operations was immediately evident. Epic sets a threshold for acceptable storage bandwidth of 1,500Mbs for reads and 300Mbs for writes. In pre-production testing of Pure arrays on a subset of hospital operations, performance results reached 3,000Mbs (reads) and 600Mbs (writes), with latencies also below Epic thresholds (11ms vs. a threshold of 15ms for reads and 3.6ms vs. 5ms for writes). Those performance levels have remained constant even as new users and workloads continue to be added.

Another indication of the impact of Pure Storage on AHS comes from Epic's System Pulse Analytics reporting service, which takes data from AHS and rates its performance against Epic's high standards. One key measure is the exception rate, a calculation of how often an activity (such as a database query) is completed in a timely fashion. The slower the performance, the higher the exception rate.

"To qualify for Epic's highest rating, Honor Roll, you need an exception rate of 1.2 or less," Nasir said. "For our infrastructure, it has been right around 0.68 ever since we moved to Pure Storage, less than half what it had been before."

The impact on business-critical functions from moving to Pure Storage arrays has been striking. One example is a daily ETL process that takes all the data from the production Caché database and moves it into the Epic Clarity and Caboodle databases, which are used to generate reports on all aspects of the organization's operations. "A lot of these data points are used extensively every day for business decision-making and proactive monitoring," Nasir noted.

"In the weeks before moving to Pure Storage, the nightly ETL averaged 5.5 hours. Due to these lengthy run times, reports could not start until around 7am and would not be ready for users until 9am," said John Musterer, Lead Database Administrator. "The first day running on Pure, ETL finished in 20 minutes — a reduction of 94%." With all Epic workloads now running on Pure, ETL averages around 90 minutes, and the majority of reports are completed by 5am. "This means we have more data available sooner for business analysts and executive decision-makers," Musterer said.

Elsewhere, Zinno added, "we have a clinical report that used to take eight hours to run and reduced it to 90 minutes."

AHS today has 11 Pure Storage arrays. In addition to supporting the Epic environment, Pure arrays also host a legacy MEDITECH EHR application, as well as virtually all other business applications. "We run around 600 applications in total across the company," Nasir reported. "About a quarter of our workloads run on Azure/SaaS, and about three-quarters on-premise — with 90% of those running on Pure."

Pure Storage also is a key element in what the company calls its V-pods (virtual pods), a type of converged infrastructure customized by AHS and deployed in remote locations such as satellite hospitals. A V-pod consists of HPE servers and a Pure array, either a FlashArray//M10 or //M20. "The V-pods allow us to take the elasticity we have in our private cloud and transparently extend that throughout the enterprise," Zinno said. "No one can tell if their applications are running locally or in the main data center. It also strengthens security."

The V-pods are attractive for their consistent management across multiple sites and the ease of deployment. A new pod can be provisioned in around five minutes, and "we can run an entire hospital in 10U of rack space," Nasir noted.

COST SAVINGS WITH EVERGREEN STORAGE

While improvements affecting patient care are the most important benefits of the move to Pure Storage, cost savings also have been significant. "For a time, storage was the number one capital and operating expense I had, but with Pure Storage we've now been able to not only level out that spending, but reduce the maintenance costs," Zinno reported. Pure's Evergreen Storage program — which guarantees customers non-disruptive access to the latest technology without forklift upgrades and with full preservation of investment in Pure solutions — was a major factor in the choice of Pure.

"Every time we had to buy a new storage platform, it always seemed like there was another type of cabinet, and then there was all the data migration, moving applications off the previous system onto the new one. I felt like a dog chasing its tail."

Nasir added, "Every time we had a rip-and-replace with EMC, it was a challenge. Not only was it expensive, but there were a lot of risks. With Pure Storage, the storage just gets faster because they're always updating the software/hardware without disruption to operations."

"Pure1 is a real game-changer for me."

Meraz Nasir,
Manager of Infrastructure Engineering

AHS estimates that the total cost of ownership with Pure Storage will result in a savings of more than $1.3 million over six years.

OPTIMIZING STORAGE MANAGEMENT

After years of struggling with the management burdens of legacy storage, the staff at AHS values the radically simplified management of Pure Storage arrays. "With our old system, I had a hard time getting an overall view of my capacity utilization and performance," Nasir said. "Pure does this amazingly well. With the Pure1™ cloud analytics dashboard, I can see at an instant how many arrays I have deployed, what their utilization is, which need code upgrades, and other important metrics. It's a real game-changer for me, in terms of being able to spend time on more important things."

Nasir also had high praise for Pure Storage's VM Analytics topology mapping tool. "It's phenomenal. It shows you every virtual machine, every Pure array, and all the paths between them. We were never able to do that before. So if there is an issue, which is rare, we can resolve it quickly."

Replication is also a far easier task with Pure Storage, AHS has found. "Our prior replication solution caused a lot of headaches with its licensing requirements and complex management," Nasir noted. "With Pure, we're able to use native replication, in conjunction with Site Recovery Manager, to replicate all business-critical applications to our secondary site and protect the entire environment. This is of huge value to the business. We used to have a one-day SLA (service level agreement) for key business applications. Now, we are under four hours."

In addition, Pure Storage's deduplication and data-compression features have exceeded all expectations. "I'm looking at my screen right now, and we're getting 10.9:1 reduction overall, and 14.6:1 on Epic. Those are astronomical numbers — three times my most optimistic expectation when we started," said Nasir.

"With Epic, there's always a need for yet-another copy of the Caché environment," he added. "With the de-dupe from Pure Storage, we can easily provide those copies to our business and application users without consuming hardly any storage capacity. It's a clear example how a technology like de-dupe has a positive business benefit."

A related savings has been observed in the requirement for a nightly refresh of the Epic environment. "In the past, it was a very complex process taking several hours," Nasir recalled. "But now, using Pure Storage's snapshot and cloning capabilities, it just takes minutes."

Enhanced data security — always an important issue for healthcare organizations — is another valuable benefit from Pure Storage. "Our prior storage was not encrypted, but Pure has encryption at rest built in, at no additional cost. So, everything on Pure is protected, with no performance impact. That's very important to us."

Noting recent episodes of ransomware attacks in the healthcare field, Nasir reported, "what we're doing now — and could never do before — is 'air-gapping', in which we take a snapshot of our entire Caché database every couple of hours and keep it in our secondary data center, so in case of a ransomware attack, we can recover from that snap. That means everything critical to us is isolated and protected."

Summarizing AHS's experience with Pure Storage, Nasir noted: "Pure is our storage standard. It's robust, fast, encrypted and replicates well. What more can we ask?"

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