PURESTORAGE®

Health Catalyst is leveraging Pure Storage to deliver real-time information and decision support to clinicians and other care-givers as a way to optimize the quality and reduce the cost of patient care.

HealthCatalyst
ignite outcomes improvement

BUSINESS TRANSFORMATION

Health Catalyst gives its healthcare clients fast, reliable access to critical data and analysis to improve patient care, lower costs, and simplify the demands on IT professionals.

GEO

North America

INDUSTRY

Healthcare

"We decided to go all-in for the best solid-state solution — and Pure Storage was the obvious choice."

Dale Sanders, *President of Technology*

HEALTH CATALYST SPARKS GROUNDBREAKING APPROACH TO REAL-TIME HEALTHCARE ANALYTICS WITH PURE STORAGE

Big data applications are found in many industries, but perhaps none are more important than those which save lives and improve medical outcomes. Health Catalyst is the leader in applying big-data analytic techniques to healthcare.

"We are a big-data company that specializes in analysis and decision-support associated with improving the quality and reducing the cost of health care," said Dale Sanders, President of Technology for Health Catalyst in Salt Lake City, Utah. The company has more than 50 health systems as clients, covering some 110 million patients.

The core of Health Catalyst's service is its groundbreaking Data Operating System (DOS), which brings together data from over 200 disparate sources — including EMRs, claims, timecards and accounting systems — and utilizes that data to comprehensively measure disease conditions and care-delivery processes. From DOS, Health Catalyst provides a wide range of analytics and workflow applications, including more than 100 that are focused on specific disease conditions or care delivery steps. It then provides services to help clients deploy a systematic approach to making improvements throughout the organization.

APPLYING ADVANCED ANALYTICS

"Despite the hype about big data being the 'next big thing' in other industries, in healthcare the reality is that we are just beginning to have the necessary analytics capabilities to enable system wide quality improvement and cost reduction," explained Sanders. "The real promise of analytics lies in its ability to transform healthcare into a truly data-driven culture. Our Data Operating System is a unique architecture that allows for analytics and real-time workflow applications to be delivered into a single experience, following Lambda architectural patterns from Silicon Valley. The DOS architecture puts a premium on the storage and I/O system to process billions of records at a time, or single records at a time," Sanders observed.

Driving that change is the data itself, the management of which presents a major challenge for Health Catalyst's IT team. Each client data platform is around 15TB, growing 40-50% a year, Sanders noted, and in total Health Catalyst manages more than 1 petabyte of data.

PURE STORAGE RECOMMENDED FOR CLIENTS

Health Catalyst offers its clients a choice between using its cloud service and having its applications hosted on the client's premises. For on-premise solutions, Health Catalyst recommends a best practice-based architecture that includes Pure Storage. Such architectures cover about half of the company's clients.

COMPANY:

Health Catalyst
www.healthcatalyst.com

USE CASE:

- Virtual Server Infrastructure – VMware® vSphere®
- Virtual Desktop Infrastructure – Microsoft® Remote Desktop Services®
- Database – Microsoft SQL Server®

CHALLENGES:

- Volume of data generated by the business is growing 40-50% a year.
- Legacy storage is unable to handle growing workloads and overly complex to manage.

IT TRANSFORMATION:

- High-performance, ultra-reliable storage delivers critical data to clients faster.
- Native encryption and high levels of data reduction simplify security and storage management.
- Software-development processes dramatically streamlined, enabling faster delivery of healthcare services.

> "ES2 allows us to add additional storage capacity on-demand with little risk, and with a predictable pricing model."
>
> Dale Sanders, *President of Technology*

Health Catalyst's choice of Pure Storage reflects the importance of high-performance, reliable storage to its business. "You can't tolerate downtime or slow time nowadays," Sanders said. "Downtime for a data warehouse is no more acceptable today than downtime for an individual patient's electronic health record. The demands for high availability are every bit as great."

That need for high availability and performance led Health Catalyst in 2015 to evaluate solid-state storage technology as a replacement for what it had always used — spinning disks. "Spinning disk arrays are crazy complicated to engineer and maintain. And if you have a problem, they are harder to fix. So, your time to recovery suffers," Sanders observed.

An incident with a major client emphasized the point. "One of our largest clients was still on spinning disk, and several things happened with the array that caused a massive failure and loss of service to the client," Sanders recalled. "It took a long time to figure out what caused the failure, and additional painful delays to restore service. In total, there were 146 hours of downtime, which was totally unacceptable to both us and the client."

In addition to high availability, the speed of storage is increasingly important to Health Catalyst's business. "In the past, you could rely on the patience of the consumers of analytics. They were willing to wait minutes or hours for a response to a query," Sanders noted. "But today, people demand faster and faster response times, to the point of real-time information."

Sanders said he knew of the performance advantages of flash storage for a long time, "but the price was too high for data-warehousing applications. Eventually, though, the price-performance of flash became too attractive to ignore, along with the demands of clients for ever-faster response times."

In the end, he noted, "we decided to go all-in for the best solid-state solution — and Pure Storage was the obvious choice."

A key factor in the choice was the Pure Evergreen™ Storage program, which guarantees customers access to the latest technology and features without forklift upgrades and with full protection of previous investment.

"The Evergreen program is the most creative and cost-effective solution out there for keeping up with the rapid growth in storage capacity as well as changes in storage technology," Sanders said. "Our cloud team doesn't have to plan on big, expensive and complex storage upgrades every five years. With Evergreen, we're always current."

ADVANCING SERVICE LEVELS

Health Catalyst has installed three Pure Storage all-flash arrays: two FlashArray//M20s and one //M50. The arrays mainly support the high-intensity, SQL Server-based analytics programs that Health Catalyst provides to its clients.

Consistently sub-millisecond latencies on Pure Storage — compared to more than 10ms on previous arrays — mean clients have the fast access times they demand for retrieving the results of complex analysis. "Pure is the first storage vendor to give us the consistent high performance we need to not only meet our SLAs to clients, but to exceed them," Sanders said.

Many of the standard features of a Pure Storage FlashArray enable Health Catalyst to deliver the features clients need without extra cost, third-party tools or management overhead. One example is encryption at rest, an essential feature (native in Purity software) for healthcare organizations to meet HIPAA requirements. Another is

replication, which allows quick, simple transfer of golden images. And the Pure Storage high data-reduction ratios — averaging more than 3:1 across all workloads — lower data-center footprint and operating costs.

Sanders is forthright about the impact that real-time information can make in a patient-care setting. "Physicians are 15 times more likely to change their treatment and ordering protocols for a patient if you give them the substantiating data at the point of care as opposed to presenting it at a meeting," he noted.

ACCELERATING TIME TO MARKET

The simplicity of Pure Storage and its integrations with other elements of Health Catalyst's infrastructure mean that IT can operate at the speed of the business. For the cloud engineering staff at Health Catalyst, managing the Pure arrays is almost effortless. "The ease with which the team can monitor our storage is unprecedented with Pure, as is the seamless integration with our VMware environment," Sanders commented.

With respect to enabling a faster path to new features and quality enhancements, Pure Storage also plays a role. Sanders added, "the software development group benefits as well, from the ease with which they can clone databases for testing and to try out new ideas. They also like the snapshot capabilities in Pure, which are helping move us closer to our goal of automating key processes."

ACHIEVING OPERATIONAL ADVANTAGE

Given its rapid growth and the fluctuating needs of its clients, Health Catalyst puts high value on flexibility. For that reason, it is an early user of the new Pure Evergreen Storage Service (ES2), a storage-as-a-service (STaaS) pay-per-use offering that delivers the agility and flexibility benefits of public cloud, coupled with the resiliency, security, performance, and cost-effectiveness of tier 1 all-flash infrastructure.

"We were getting into a situation where we wanted to bring on new customers quickly, but the process of getting procurement authorization for additional storage imposed unacceptable delays," Sanders reported. "ES2 is a perfect fit for several reasons. It allows us to add additional storage capacity on-demand with little risk, like a public cloud, and with a predictable pricing model that we could easily apply to the pricing we offered to our clients. And, it maintains all the benefits we have come to expect from Pure Storage arrays."

ES2 provides on-demand storage at one-half the cost of a public cloud with proven reliability, and exceeds both the technical and financial requirements set by Health Catalyst.

WHAT IT ALL MEANS

By employing Pure Storage, Health Catalyst is able to provide the most advanced service levels to its clients, accelerate time to revenue for those services, and achieve savings in both capital and operating costs.

Sanders sees Pure Storage as a good fit for the direction Health Catalyst is taking the industry. "At the patient level, real-time analysis and decision support are critical. This is where the industry is moving, and is why we are in a leadership position today. Having Pure as our strategic storage partner gives us the ability and confidence to deliver services to our clients that are at the very leading edge of the industry."

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