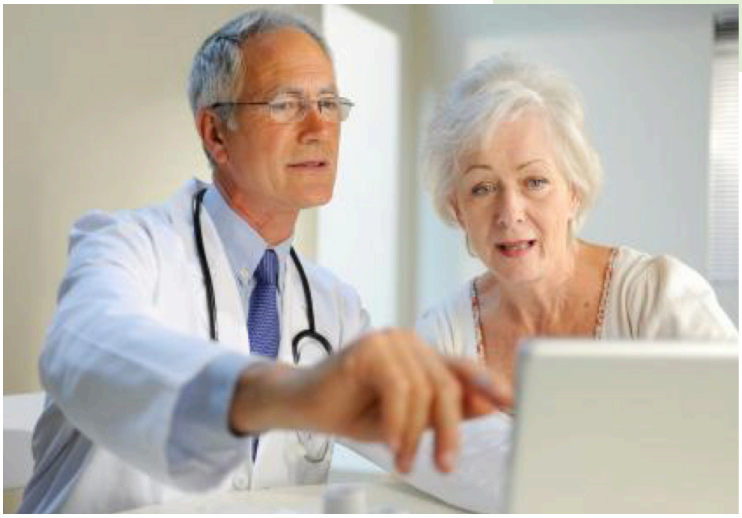
DriveScale

CASE STUDY

Clearsense Leverages DriveScale to Implement Private Cloud

Health care analytics provider moves from public cloud to on-premise while lowering costs and increasing agility.



DriveScale's Software Composable Infrastructure (SCI) is a next generation data center architecture that treats hardware infrastructure as code, delivering significant gains in efficiency and agility, while lowering both equipment and operating costs.

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— Charles Boicey, Chief Innovation Officer at Clearsense

Executive Summary

This case study highlights the experiences of Clearsense, a healthcare analytics provider, who like many organizations started deploying their Big Data workloads on a public cloud service, but quickly realized significant challenges in meeting their performance, cost and agility goals as they moved into production. This led to Clearsense migrating from a public cloud infrastructure to an on-premises data center where they were able to overcome these issues by taking advantage of DriveScale's Software Composable Infrastructure (SCI) solution.

DriveScale helped Clearsense meet their performance requirements and scale easily and quickly while dramatically lowering overall costs when compared to Amazon's AWS cloud service. By lowering their expenses, Clearsense was able to achieve their goal of helping small and rural hospitals that would otherwise not be able to afford the benefits of their analytics service.

Customer Profile

Company: Clearsense

Industry: Information Technology and Services for Healthcare Organizations

Location: Jacksonville, Florida, USA

Website: http://clearsense.com/

Charles Boicey, Chief Innovation Officer at Clearsense, began his career as a trauma critical care nurse at the USC Medical Center in Los Angeles County. During his 12 years there, Charles and his colleagues were often frustrated to look back on a patient's treatment records and discover that some piece of data might have indicated a better course of care. In the more extreme cases, better data might have saved lives that were lost in the emergency room.

Boicey and his co-founders saw the need for a healthcare predictive analytics service, and started Clearsense to capture and analyze patient data in order to make better, faster clinical decisions. A top priority for Clearsense was to deliver this service at the lowest possible cost in order to make their analytics service affordable to any size healthcare organization – from 50-bed safety net hospitals to integrated delivery care networks spanning 50+ hospitals.

Clearsense's Inception solution is a secure healthcare data ecosystem that consumes data from an array of sources to provide a real-time, smart view of the healthcare environment. The Inception analytics service is used by healthcare organizations, insurance providers, and the academic community to help with critical decisions in the following areas:

- *Clinical Decisions* – pulls in all relevant patient information in real-time for early detection of patient deterioration to reduce catastrophic consequences and optimize outcomes
- *Operational Decisions* – identifies and eliminates variations in the care delivery process to find opportunities for improvement
- *Financial Decisions* – tracks organizational KPIs related to financial goals

Challenges

Clearsense initially hosted their Inception platform on Amazon Web Services' public cloud infrastructure, leveraging Amazon's EC2 virtualized cloud infrastructure so they could quickly scale as they brought more customers online.

After hosting Inception on EC2 for about a year, Clearsense discovered that the performance of their Hadoop cluster was inconsistent, and they were suffering from the "noisy neighbor" effect. Noisy neighbor refers to a situation where one or more co-tenants of a public cloud computing infrastructure monopolize bandwidth, disk I/O, CPU or other resources, and negatively impact other users' performance on the shared infrastructure. Unfortunately, this is not an uncommon situation and is completely unpredictable.

To prevent the problem and ensure they met their performance goals, Clearsense started using Amazon's EC2 Dedicated Instances service, which provides host systems that are dedicated to a single customer and isolates them from the noisy neighbor issue. EC2 Dedicated Instances, however, is much more expensive than the multi-tenant EC2 service, and Clearsense realized they were effectively paying for the cost of their infrastructure several times a year.

Furthermore, by requiring dedicated servers to run their workloads, Clearsense was no longer able to take advantage of the flexibility and scalability of the standard EC2 service. Provisioning new hosts or making other changes to their infrastructure now took weeks, which not only caused delays, but also greatly complicated their capacity planning efforts. Upgrades had to be planned well in advance, and growth in workload use or storage requirements was difficult to forecast accurately.

Solution

Due to the expensive and inelastic nature of their AWS public cloud infrastructure, Clearsense started to explore better options to serve their clients in a more efficient and cost-effective manner, and they decided to take a closer look at a solution from DriveScale.

DriveScale's Software Composable Infrastructure (SCI) is a next generation data center architecture that treats hardware infrastructure as code, delivering significant gains in efficiency and agility, while lowering both equipment and operating costs.

DriveScale supports modern workloads such as Hadoop, NoSQL databases, and other big data technologies, which are dynamic and unpredictable as data grows exponentially and enterprises find innovative ways to mine their information for business value. IT administrators often struggle to correctly size physical infrastructure for these dynamic applications, or to respond quickly to changing workloads that might be experiencing a spike in demand.

With DriveScale's SCI solution, Clearsense administrators were able to disaggregate the components of a typical physical server and deploy separate pools of compute and storage resources in their data center. In their case, Clearsense is using Dell disk-lite servers and JBODs (Just a Bunch of Drives), but DriveScale works with any industry standard server and storage (see Figure 1). Organizations with existing on-premises infrastructure don't have to replace their servers to take advantage of DriveScale's SCI

system. They would simply start deploying new racks using the SCI architecture, and replace existing equipment over time as part of a lifecycle refresh.

Using DriveScale, Clearsense administrators are able to combine and recombine compute and storage resources into *software-defined physical nodes and clusters* that are indistinguishable from standard servers to the software running on them. SCI allows them to attach any drive to any server, effectively "composing" servers and clusters that are optimized for the needs of a particular workload. Performance is equivalent to standard servers with internal drives.

If a workload needs additional compute or storage resources, it's as easy as a few keyboard clicks to add more to the cluster. Once a workload is complete, these resources can be returned to the pool for use by other applications. This composition and re-composition happens under software control, which is fast and doesn't require anyone to physically touch or re-configure any of the equipment. Resources are no longer trapped in separate silos.

With the ability to compose and modify servers and clusters on the fly under software control, Clearsense is able to maximize the utilization of their assets, respond quickly to changing application environments, and save on equipment and operating expenses.

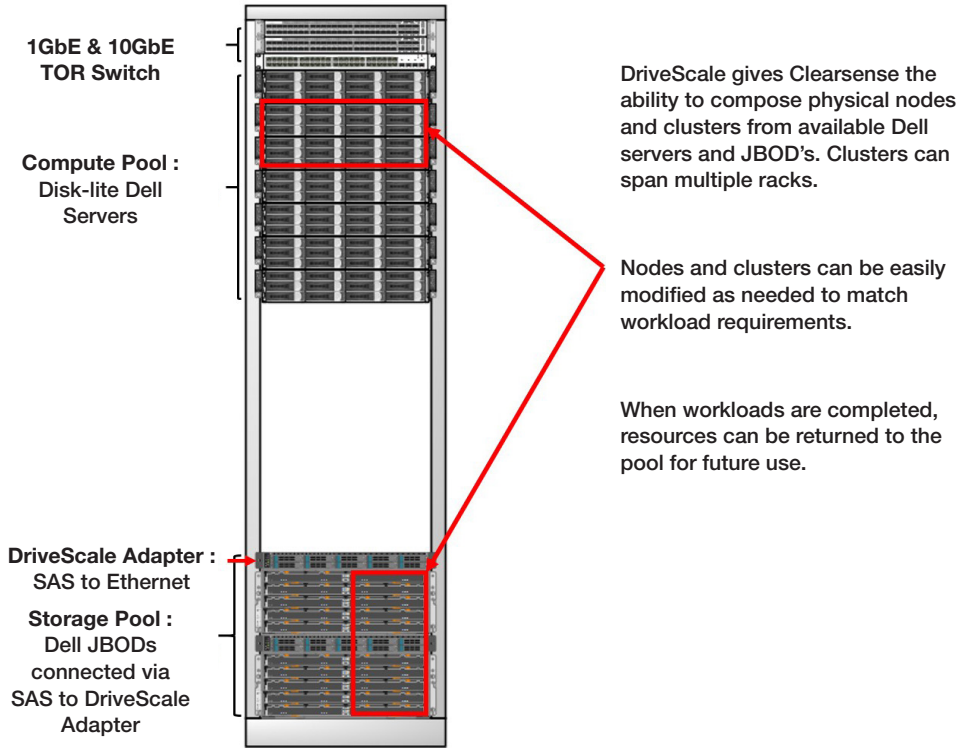

Figure 1: Illustration of DriveScale SCI architecture

DriveScale was a key enabler for Clearsense to migrate their Inception platform from AWS to an on-premises infrastructure, while alleviating all of their issues with the public cloud:

- **Reduced Costs -** According to Clearsense, they were paying for their servers every 4 months in the public cloud. With DriveScale, they're now paying for them every 4 years. Upgrade costs are also significantly lower since Clearsense can replace servers without having to replace their disk drives. Compute and storage resources can be upgraded independently as needed.
- **Increased Agility -** With DriveScale, Clearsense can quickly and easily add or re-allocate compute and storage resources across multiple workloads as application demand changes, removing the typical silos that lead to underutilization. Provisioning time has been reduced from weeks to minutes.
- **Predictable Performance -** The DriveScale system delivers equivalent performance to a bare metal server with internal, direct attached storage. Clearsense no longer worries about other public cloud tenants impacting the performance of their workloads, and it's easier and faster to upgrade their servers since IT no longer has to copy data from old disks to new ones.

Summary

DriveScale helped the Clearsense IT team achieve higher utilization levels, reduce over-provisioning and respond much more quickly to changing business requirements. As Boicey said, "The public cloud was a great place to launch our service, but as we became a large production application, bringing our computing platform in-house with DriveScale was a big win."

Perhaps most importantly, implementing DriveScale has helped Clearsense achieve one of their key goals – helping rural and underserved hospitals that would not be able to afford their analytics solution. Boicey summed it up well, "With the technology choices Clearsense has made, including adopting the DriveScale solution, we are able to offer healthcare analytics at scale and at a cost that everyone can afford."

For more information on DriveScale's Software Composable Infrastructure solution, please visit www.drivescale.com, or contact us at info@drivescale.com.

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