



Keck Medical Center of USC

Keck Medical Center of USC Sidesteps SAN Bottleneck, Launches New Data Warehouse with VMware Virtual SAN Solution

INDUSTRY

Healthcare

LOCATION

Los Angeles, California

KEY CHALLENGES

- Lack of necessary SAN capacity and horsepower for a new high-priority data warehouse
- Insufficient funding for SAN expansion
- Limited manpower for ongoing SAN management

SOLUTION

Keck Medical Center of USC deployed a new data warehouse using the VMware Virtual SAN storage solution on Dell PowerEdge R715 servers and Fusion-io drives for flash acceleration.

BUSINESS BENEFITS

- Vastly simpler storage management that could be handled by a small team
- As-needed scalability that allows Keck to stagger spending
- Lower cost of I/O compared to traditional SANs
- Ability to leverage the latest technology

Keck Medical Center of USC needed a new data warehouse for business and medical analytics but didn't have room for the data in its conventional SAN. Seeking an alternative to the capital expense of an adequate SAN expansion, the center's IT team launched a new system using the VMware Virtual SAN™ hyperconverged infrastructure solution. Business and operational benefits include swift deployment, simpler storage management, as-needed scalability, and lower cost per I/O.

Keck Medical Center of USC is a world-class academic medical facility for translational medical research and compassionate patient care. As part of the University of Southern California's medical enterprise, it operates two acute care hospitals: the 401-bed Keck Hospital of USC and the 60-bed USC Norris Cancer Hospital. U.S. News & World Report has ranked Keck Medical among the top 10 U.S. hospitals in ophthalmology care, and among the top 25 in urology and cancer care.

The Challenge

Managers at Keck Medical Center wanted a new data warehouse to collect structured and unstructured data from its healthcare management systems for exploration by business analysts, physicians, and medical researchers. The center's IT team quickly chose QlikView Business Discovery as its data management solution. Unfortunately, it also discovered that the center's SAN lacked the necessary capacity and horsepower and that adequate funds to expand it were unavailable.

With no room in the SAN, a limited budget, and an impatient cohort of frustrated analysts, the Keck team urgently needed a more flexible and affordable storage solution. Storage they could deploy quickly with just the capacity they needed to launch. Storage they could scale easily and affordably as application requirements changed. Storage that would be easy to manage and that wouldn't lock them into expensive proprietary hardware.

The Solution

What the Keck team did have was significant experience in virtualization, with 90 percent of its production servers already running on the VMware vSphere® virtualization platform. It also had someone who had been monitoring the development of the VMware Virtual SAN storage product, waiting for the right use case.

"I'd been fascinated with the concept of the Software-Defined Data Center," says Manu Mishra, a senior engineer responsible for virtualization and storage infrastructure at Keck Medical. "When VMware announced Virtual SAN, I realized that this would be the future of storage, especially for virtualized environments. When they released the product, I knew it was time to jump in."

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- Manu Mishra,
Senior Infrastructure Engineer,
Keck Medical Center of USC

VMWARE FOOTPRINT

- VMware Virtual SAN
- VMware vSphere
- VMware Site Recovery Manager

APPLICATIONS VIRTUALIZED

- QlikView Business Discovery

PLATFORM

- Dell PowerEdge R715 servers

The Keck team’s solution was to create a pair of storage clusters, building out existing VMware vSphere hosts (Dell PowerEdge R715 servers) with internal hard drives and Fusion-io flash drives. The Virtual SAN solution created a shared, distributed datastore from the server-attached disks. At Keck, one five-node Virtual SAN cluster hosts the new warehouse’s production virtual machines with approximately 15TB of production data; a second three-node cluster houses more than 10TB of development desktops and backup data. The three-node cluster integrates with the VMware Site Recovery Manager™ disaster recovery management solution for failover and high availability.

The new data warehouse now supports 150 active users. Its user base will gradually rise to around 500 as new data sources are integrated over time.

Business Benefits

By hosting its new data warehouse in a Virtual SAN storage environment, the Keck Medical Center got a stalled development project quickly into production and realized a variety of business and operational benefits.

Vastly Simpler Storage Management

Implementing the Virtual SAN solution has dramatically reduced the administrative workloads associated with storage management. “There’s literally one check box to create your storage and nothing to manage afterward,” Mishra says. “With a traditional SAN architecture, there are a lot of components to manage: Fibre Channel switches, SAN controllers, and host bus adapters [HBAs]. With Virtual SAN we don’t have to think about any of those things.”

Another labor saver is storage policy-based management of objects in the Virtual SAN solution. “We can tag a virtual machine for specific storage performance metrics according to the application’s needs,” Mishra says. “As those needs change over time, we can easily change the policies that govern storage performance.”

Affordable, As-Needed Scalability

The flexible architecture of the Virtual SAN solution allows the Keck team to grow its storage incrementally, either by adding disks to existing VMware ESX® hosts or adding new hosts to a cluster. “We started the warehouse production cluster with three nodes,” Mishra recalls. “When we decided to add two nodes, it was a seamless process. We just dragged and dropped two new hosts into the cluster and our storage pool grew automatically.”

Lower Cost per I/O

Because the Virtual SAN product is both simpler than big-iron storage solutions and hardware-agnostic, the Keck team was able to significantly reduce its cost of I/O. “We didn’t have to buy Fibre Channel switches, or HBAs,” Mishra says. “We don’t have to maintain that equipment. We can use commodity servers and drives to build a storage cluster for 30 percent less than the cost of similarly performing storage in a traditional SAN solution.”

Ability to Leverage the Latest Technology

Because the Virtual SAN product is a hyperconverged storage solution, storage refreshes can be made in conjunction with server refreshes, allowing the Keck team to use the latest and fastest storage drives while still taking advantage of declining drive prices. “We refresh our hardware roughly every three and a half years. It allows us to also upgrade our storage during the refresh cycle, taking advantage of faster CPUs, better flash, and faster drives, compared to a storage platform refresh, which may happen once every 7 to 10 years,” Mishra explains.

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- Manu Mishra,
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Looking Ahead

The new data warehouse has given the Keck Medical Center team an opportunity to evaluate the Virtual SAN solution and assess its future in their production environment. “Our data center is 90 percent virtualized, and I see Virtual SAN as a compelling storage solution for virtual machines,” Mishra says. “In the future, I can see hosting most of that environment on Virtual SAN. We wouldn’t have to worry about managing conventional storage and could focus more of our attention on delivering projects that directly support the business.”

