Success Story

Adena Health System Improves Outcomes and Cuts Costs with a Converged Infrastructure Built on FlexPod

Customer Profile
Since its founding in 1895, Adena Health System has grown to become a leading, trusted healthcare organization in south-central Ohio. With 14 locations across 12 counties, the 225-bed not-for-profit organization employs 2,500 people who provide general medical and surgical care as well as specialty care in areas such as cardiology, women’s health, oncology, orthopaedics, and rehabilitation to more than 440,000 people in the region.

The Challenge
Enhance delivery of patient care by upgrading the IT infrastructure.

The Solution
Deploy the FlexPod® data center platform from NetApp and Cisco and Citrix XenServer for virtualization.

Benefits
- Six- to seven-fold performance gains benefit clinicians and patients
- Reduces access time delays for ChartMaxx from 3 minutes to 2 milliseconds
- Shortens reporting time five times, from 2.5 hours to 26 minutes
- Reduces costs and streamlines IT management

Physicians and staff at Adena rely on mission-critical systems for healthcare, including eClinicalWorks in-patient clinical information software, MEDITECH for electronic medical records, MedPlus ChartMaxx electronic health records (EHR), LUMEDX cardiovascular, as well as PACS radiology and real-time video security systems. Adena also maintains business systems such as Lawson Enterprise Resource Planning (ERP) for human resources, Microsoft® Exchange Server, reimbursement systems supporting value-based purchasing, Cisco® Voice over IP-based telecommunications, and various custom SQL Server® databases.

All of these systems are important for delivering superb and responsive patient care, as well as supporting staff, from clinicians to business managers.

These systems generate hundreds of terabytes of data and are supported by thousands of personal computers and hundreds of servers, approximately 300 of them virtualized, to maximize resource utilization. The responsibility for keeping these systems—and
“Successfully implementing a transition of this size and complexity is a testament to the excellence of the NetApp technologies and services.”

Brian Young
Manager of Infrastructure and Telecommunications, Adena Health System

Adena’s medical facilities—operating smoothly falls to Brian Young, manager of Infrastructure and Telecommunications for Adena Health System, assisted by an IT staff of 46.

Latency and delays, compounded by storage cost and complexity
When Young examined Adena’s technology infrastructure, he saw several opportunities for improvement. Among them was the organization’s aging and underperforming storage area network (SAN) that supported its mission-critical applications.

Slow response times and high disk latencies due to the inability to scale bandwidth for data growth were causing delays in getting important information. For example, MEDITECH reports for updating medications and other processes could take several hours to run. Up to nine MEDITECH jobs were routinely held in a queue, waiting for storage disk activity to abate. With the ChartMaxx EHR system, accessed in environments such as the ER, delays in information access could reach up to three minutes.

At the heart of the organization’s issues was an expensive, underutilized, and difficult-to-manage SAN. Arcane and siloed storage management software further degraded system performance. As a result, Adena technical specialists saw an opportunity in acquiring storage that could be more fully utilized and easily maintained.

“We needed to enhance performance of key solutions such as ChartMaxx to become even more responsive to patients,” recalls Young. “And we needed to act quickly to take advantage of newer, more advanced technologies.”

The Solution
A prevalidated, trusted option: FlexPod from NetApp and Cisco
To reduce costs and streamline IT operations—with the ultimate aim of improving service to both clinicians and patients—Adena made a strategic decision. Rather than update its IT infrastructure piecemeal, the organization decided to overhaul both data centers. The initial aims were to replace the incumbent SAN, move to Cisco servers, and adopt Citrix XenServer technology to support a cost-effective virtualization strategy.

When presented with NetApp® FAS3270 storage systems, Young was impressed with their simplicity, performance, and cost effectiveness. Subsequently, Cisco and NetApp collaborated to deliver FlexPod, a prevalidated data center solution built on a flexible shared infrastructure. FlexPod is composed of presized storage, networking, and server components. FlexPod components include NetApp unified storage systems, Cisco Unified Computing System™ (UCS™) servers, and Cisco Nexus® switches. But in Young’s eyes, FlexPod represented more than just a simplified, powerful technology platform; it also presented the opportunity to work with some of the industry’s most talented and experienced people.

NetApp speeds deployment and reduces business risks
The FlexPod Implementation Service from NetApp Professional Services leveraged people, processes, and technology to help enable a successful deployment and achieve the best results from the FlexPod platform. The presales scoping team used advanced tools such as the NetApp nSANity Data Collector, a support tool designed to aid in troubleshooting complex SAN issues. They also used NetApp OnCommand® Insight Plan for capacity planning.

In addition to the fact that NetApp provided technology excellence, NetApp’s data validation, compatibility testing, sizing, and design procedures were so thorough that Adena IT awarded the contract to NetApp. NetApp Professional Services then worked closely with Adena to assist with a smooth transition that was completed with no unplanned downtime.
"I can’t speak highly enough about NetApp technology and solutions, as well as NetApp’s ability to understand our environment and objectives," says Young. "Successfully implementing a transition of this size and complexity is a testament to the excellence of the NetApp technologies and services."

The initial configuration consists of two NetApp FAS3270 storage systems, as well as Cisco Unified Computing System (UCS) B200 M2 and B200 M3 blade servers. The blade servers connect to Cisco Nexus 7000 Series switches over 10-Gigabit Ethernet. These switches, in turn, connect via Fibre Channel to a Cisco MDS 9140 multilayer fabric switch, which interfaces directly with the NetApp storage systems. The organization also is purchasing two additional NetApp FAS3270 storage systems for data replication.

**Business Benefits**

**Cost-effective foundation for mission-critical systems**

Adena’s servers are now 75% virtualized, with 150 physical servers moved to Citrix XenServer 5.6 virtual machines built on FlexPod. More than 140TB of data and most mission-critical applications are virtualized and running on FlexPod, including telecommunications, cardiology, eClinicalWorks, Lawson ERP, SQL Server instances, and other custom applications. Migration of PACS radiology and Microsoft Exchange Server software is in progress. The two most highly critical applications, MEDITECH and ChartMaxx, rely on physical servers.

According to Young, the move to FlexPod resulted in tremendous technical benefits that led to cost reductions and other business benefits. The organization cut disk drive expenditures without compromising availability by using NetApp RAID-DP® technology instead of RAID 10 and has moved to a less costly virtualization solution. By moving to the Cisco UCS, NetApp, and Citrix framework, Adena achieved a 95% reduction in data center footprint, leading to a $200,000 per year savings in power and cooling costs—all while improving reliability and performance.

Operational efficiencies that contribute to additional cost savings have rapidly accrued. The IT team is using NetApp deduplication, a feature of the NetApp Data ONTAP® operating system, to eliminate the need for storing multiple instances of objects. Through deduplication, Adena reclaimed more than 1TB of storage on one key file server alone, avoiding thousands of dollars of expense. Thin provisioning is also being used in the virtualized environment to save costs by better matching storage supply with demand. And, using NetApp OnCommand Insight Balance, IT can more easily monitor performance and capacity to help enable both medical and business-oriented systems to operate responsively.

**Enhanced healthcare outcomes through IT**

Today, Adena can operate more efficiently and provide more responsive solutions that assist clinicians in enhancing patient care. The move to FlexPod, for example, supports more immediate delivery of data and information needed in emergency situations. Job queues, latency, and slow response times are issues of the past. Overall performance has improved six- to seven-fold, and even more in certain instances. Previous three-minute access times for ChartMaxx have been reduced to two milliseconds. MEDITECH applications and reports, such as those required to assess and alter patient medications, which previously took up to 2.5 hours, can now be completed in a matter of minutes.

For this cutting-edge healthcare organization, the outcomes from moving to FlexPod prove that IT can be a powerful enabler in healthcare. Fast, reliable access to data contributes to better patient safety and satisfaction, as well as efficiencies that promote increased...
referrals and a more productive nursing staff. Even financial processes such as reimbursement have improved.

“The performance we gained from FlexPod helped us enhance patient care and staff satisfaction, as well as contributes to more efficient business processes. All of these enhancements are vital in today’s healthcare world.”

Brian Young
Manager of Infrastructure and Telecommunications, Adena Health System

SOLUTION COMPONENTS

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Virtualization Components

Citrix XenServer 5.6

NetApp Software

Data ONTAP 8 operating in 7-Mode
Deduplication
Thin provisioning
OnCommand Insight Balance
nSANity Data Collector

Third-Party Products

Databases: Microsoft SQL Server 2005 and 2008, Oracle® 10.2
Server platform: Microsoft Windows® servers 2008

NetApp Professional Services

Scoping, design, data migration, and server virtualization services

Protocols

FCoE
iSCSI