



SDS in Practice at Mission Community Hospital



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DataCore Software

- **Why Software-defined Storage?**
- **Customer example: Mission Community Hospital**
- **DataCore Software-defined Storage**



8 of 10 Healthcare Orgs are not Prepared for Disaster Recovery (DR) Incident

■ Data Loss

- **28%** have experienced data loss in the past 12 months at a cost of **\$807,571** per incident
- And of those, 39% have experienced 5 or more incidents in the past 12 months
- Most Common causes: HW failure, Loss of Power, Loss of Backup Power

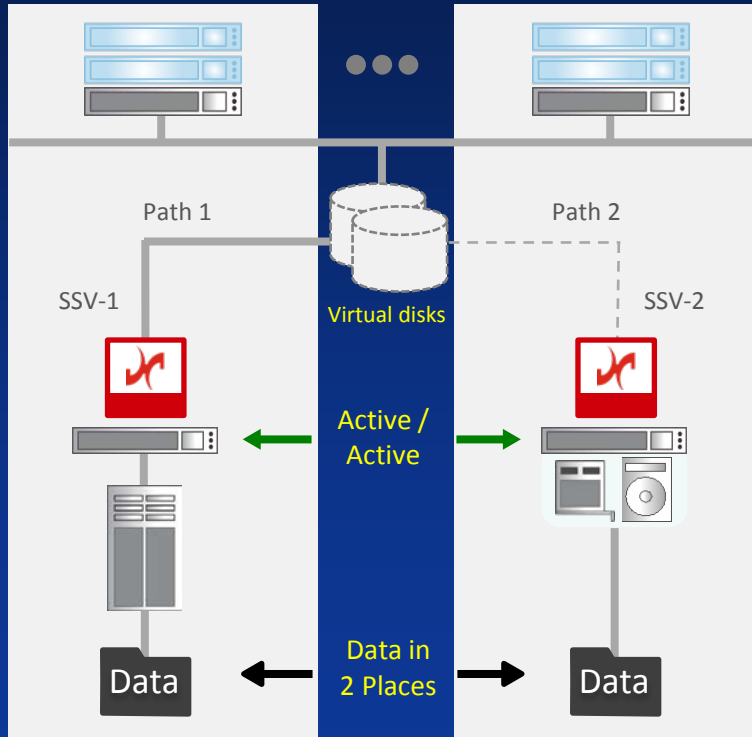
■ Unplanned Outage

- **40%** have had an unplanned outage in the past 12 months at a cost of **\$432,000** per incident
- On average, 57 hours of unplanned downtime over the past 12 months
- Most Common Causes: HW failure, SW failure, data corruption

■ Summary

- **82%** say their infrastructure is not fully prepared for a DR incident
- Only 27% believe they are fully prepared to ensure continuous availability of electronic protected health information (ePHI) during outages
- Only 50% are confident 100% of data can be restored per SLA
- 56% would need 8 hours + to restore 100% of data

Zero Downtime, Zero Touch



Zero Downtime

- Active/Active failover
- Same or different locations

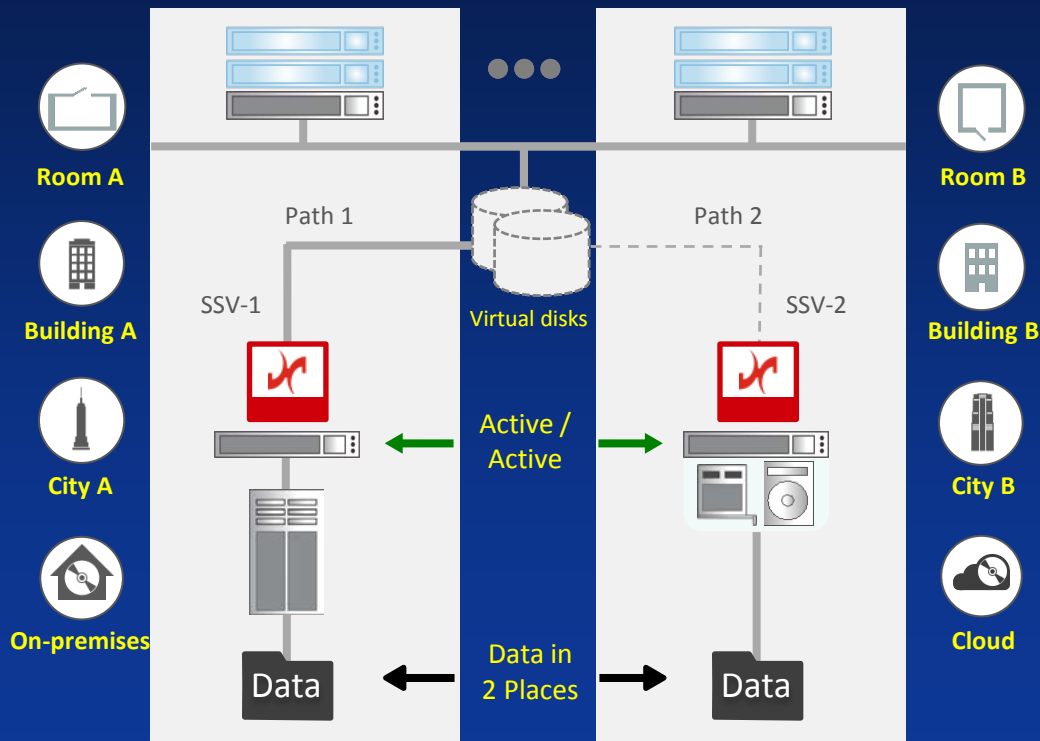
Zero Touch Failover and Failback

- Completely automated
- Live maintenance (upgrades and migrations)

Lowest TCO

- Supports different storage environments on each side
- Use existing storage

Stretch Cluster for Higher Availability



Zero Downtime

- Active/Active failover
- Same or different locations

Zero Touch Failover and Failback

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Lowest TCO

- Supports different storage environments on each side
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Why Software-defined Storage (SDS)?

The right software must be able to do a few things...

1

Enable **different** storage devices to **communicate** with one another

2

Separate advances in **software** from advances in **hardware**

3

Pool all storage capacity and provide centralized **management**

4

Make hardware maintenance, data migrations, and hardware refreshes **easy**

- Why Software-defined Storage?
- Customer example: Mission Community Hospital
- DataCore Software-defined Storage



*Compassionate Healthcare.
Quality Healthcare.*

Creating an Enterprise Storage Strategy



Introduction to MCH

- 145 bed hospital located in Los Angeles area
- Specialize in acute, surgical & behavioral health
- 1K employees, including 500 physicians
- 7K in-patient visits per year
- 25K emergency room visits per year



MCH's Clinical Objectives

- Provide high quality professional healthcare
 - Around the clock
- Reach more patients in northwest L.A.

Life-Critical Applications

- **Paragon Integrated Clinical & Financial**

- Hospital Information System
- Electronic Health Records (EHR)

- **Horizon Patient Folder**

- Document management system

- **Claims Administrator (Billing)**

- **Picture Archiving & Communication System (PACS)**



MCH Storage Challenges

- **Storage was primary DAS and NAS**
 - Frequent downtime
 - Not enough performance
 - Maintenance & management complexity
- **Cost constrained so storage based on projects**
- **Future: would be virtualizing apps & needed shared storage**
 - Goal: Create tiered enterprise storage strategy

MCH Storage Goals

- **High Availability for virtualized applications**
- **Simplify management**
- **Provide path for continual growth of data**
- **Cost-effectively raise performance levels to match needs of virtualized applications**
 - **Didn't want tier 1 storage for everything**
- **Value more important than cost**

Storage Options Considered

- Evaluated storage offerings from HP & Dell
- But,
 - Tied to that storage vendor
 - Only one vendor for diversity of projects
 - Adding capacity would be disruptive
 - No increase in functionality till renewal
 - New functionality would require buying new hardware platform

DataCore's SDS Platform

- **Virtualizes the storage layer**
 - Deploy the best storage for each project in any tier from any hardware vendor
 - Lowest TCO
- **Single pane management across all storage hw**
- **Add functionality without any disruption**
 - Add functionality sooner than HW refresh
 - Functionality available for all storage HW
 - Not just for that storage system / device

MCH Infrastructure

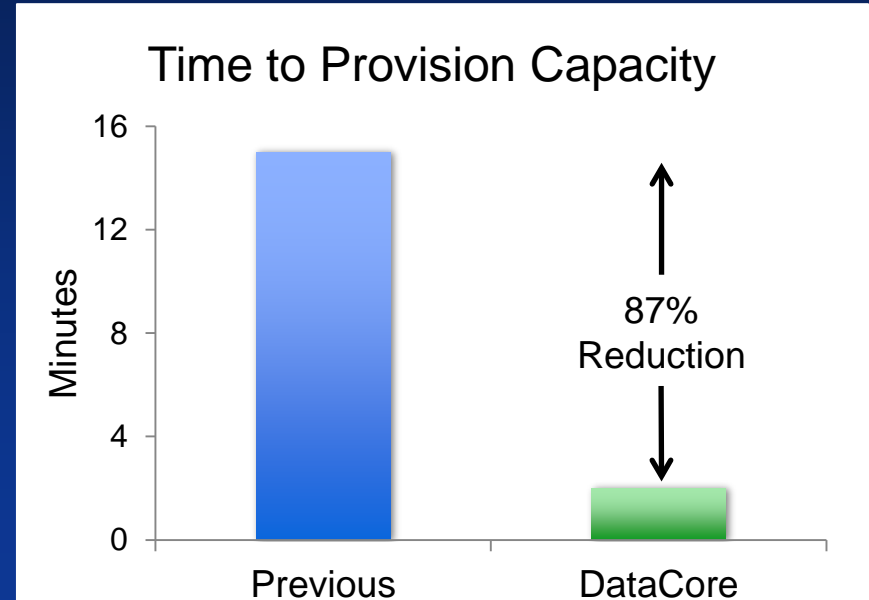
- **20 physical hosts**
 - 16 VMware vSphere
 - 4 Windows Servers
- **300+ VMs**
- **Dell R720 servers**
- **120 TBs of storage**
- **FC**
 - XIOtech
 - Dell Compellent
- **iSCSI**
 - HP MSA
 - Dell EqualLogic

Goal: No Downtime

- **Synchronous mirroring across storage devices**
 - One storage device failed, but data still available to apps
 - Able to take a storage device offline without affecting applications
- **2 years without any data outages**
 - Since purchase & deployment of DataCore

Goal: Simplified Management

- Single administrative pane
- Easy to create virtual drives
- Storage maintenance during normal hours
 - Instead of nights and weekends



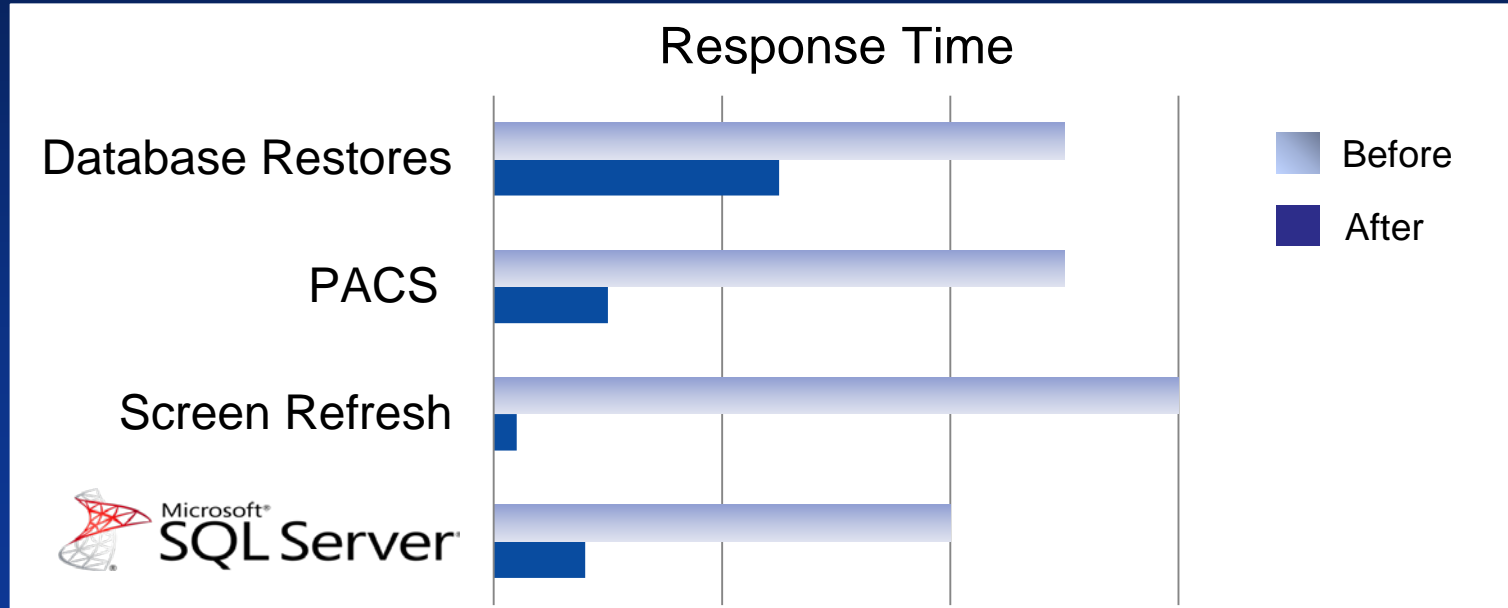
Goal: Easy Expansion

- Moving to full Electronic Health Record system
- Needed additional 20 TBs
- Previously, would have taken 1 week or more to get new capacity online
- With DataCore
 - A few hours, during normal business hours, with no downtime

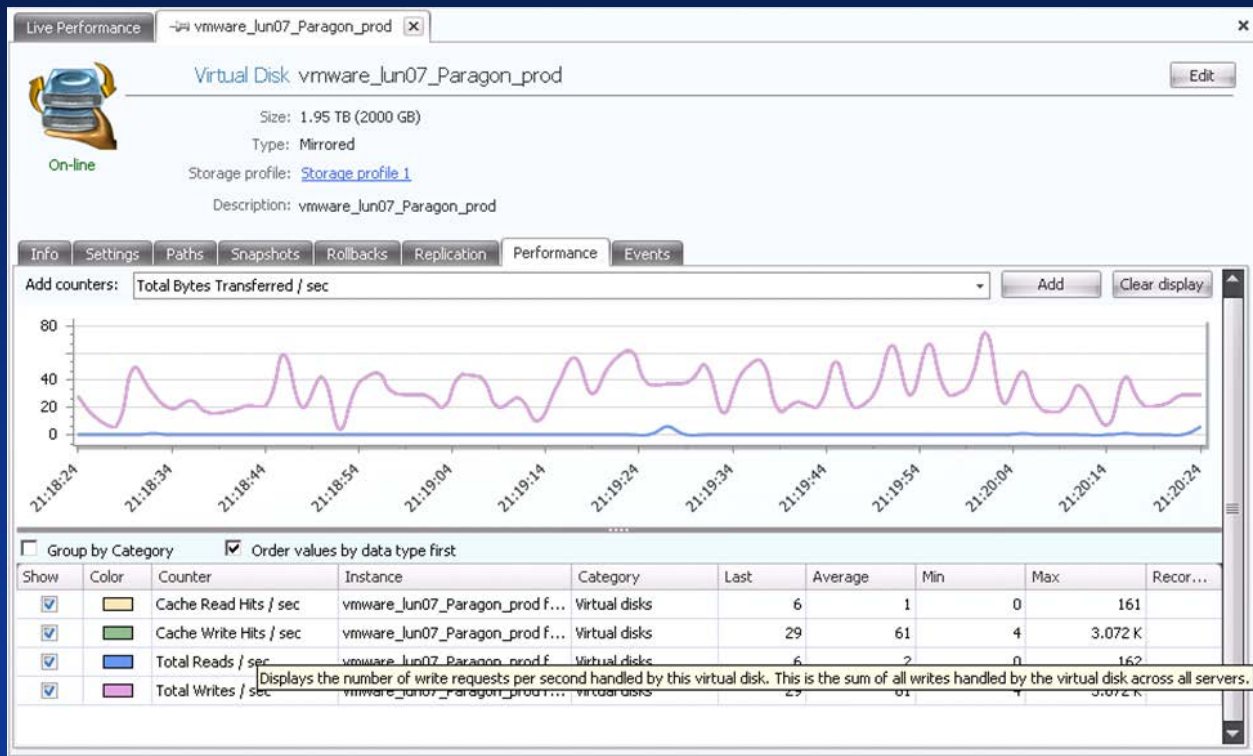
Goal: High Performance

- Quite a few SQL databases in environment
- PACS system (CARESTREAM)
 - 2 Oracle DBs → write & retrieve large files
 - Recommended to NOT virtualize due to storage I/O bottlenecks
 - Virtualized with DataCore → No performance issues

Supercharged Performance



Real-time & Historical Performance Charting



Deploying DataCore SDS Platform

- Migrate apps from physical to virtual machines
- Reconnect drives behind DataCore
 - “Pass-through” disks
- Incorporate additional storage arrays

Current Infrastructure with DataCore

- Environment has become more stable
- Significantly less (~90%) pages after hours
 - Previously, had lots of latency issues with slow applications, including clinical applications and email
- Also, great support team
 - Much better support than larger storage vendors

- **Why Software-defined Storage?**
- **Customer example: Mission Community Hospital**
- **DataCore Software-defined Storage**

3X or better on price performance!

DATACore's SPC-1 PRICE-PERFORMANCE™ WORLD RECORD RESULTS!

PERFORMANCE

459,290.87

SPC-1 IOPS™ in 2U



**Smallest
Footprint**

PRICE-PERFORMANCE

\$0.08

Per SPC-1 IOPS™



**Lowest Cost,
Maximum I/O**

RESPONSE TIME

0.32

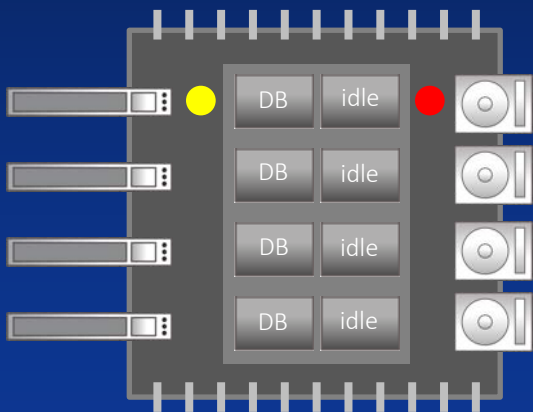
milliseconds



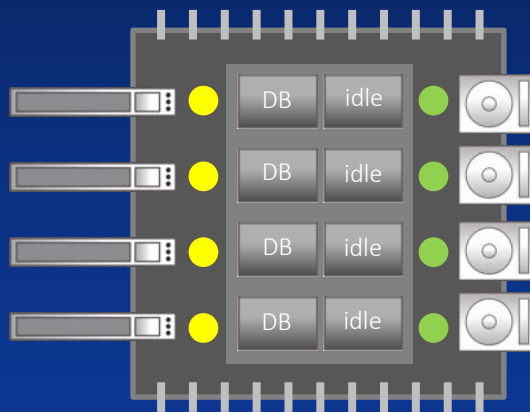
**Ultra Fast
Applications**

DATA CORE PARALLEL I/O TECHNOLOGY

WITHOUT PARALLEL I/O
I/O processed sequentially...



WITH PARALLEL I/O
I/O processed in parallel...



DataCore SDS Platform is the Foundation for Responsive IT

- Healthcare Information Systems
- Electronic Health Records
- PACS / Radiology &
Vendor Neutral Archives
- Claims Administration & Billing
- Electronic Document
Management
- Payroll & Human
Resource Management
- Mail, Messaging &
Collaboration



Accelerate

Rapid data access

Store

Optimal use of capacity

Safeguard

Continuous data availability

Full Stack of Storage Services

SharePoint

Exchange

Microsoft
SQL Server™

ORACLE®

SAP®

VIRTUALIZED HOSTS

PHYSICAL SERVERS

DataCore SANsymphony SDS Platform

PERFORMANCE

- High Speed Caching
- Auto-tiering
- Random Write Accelerator
- Quality of Service (QoS)

AVAILABILITY

- Synchronous Mirroring
- Asynchronous Replication
- CDP
- Snapshots / Backups

EFFICIENCY

- Storage Pooling
- Thin Provisioning
- Data Migration
- Deduplication/Compression

MANAGEMENT

- NAS/SAN (Unified Storage)
- Centralized Management
- VVols
- Cloud Integration
- Analysis & Reporting

Compelling Outcomes

DEPLOY FLASH STORAGE



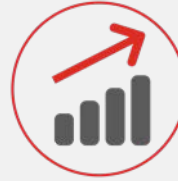
79% improved performance by
3X or more

BC / DR



60% reduced storage-related downtime by
90% of more

STORAGE EXPANSION



82% reduced storage-related spending by
25% or more

STORAGE REFRESH



100% saw a
positive ROI
in the first year

30,000+ Deployments Worldwide

10,000+ Customers

10th Gen Product

Companies in all Industries & Sizes

Market: Software-defined Storage

Technology: Storage Virtualization & Parallel I/O



Main Offices

- Australia
- Germany
- France
- Japan
- UK
- USA

Thank You!

www.datacore.com

When HealthCare IT Under Delivers ...

- Staff suffers recurring lapses in information access
- Patients wait too long for service
- Get sicker as a result of avoidable errors
- Costs rise to correct & recover



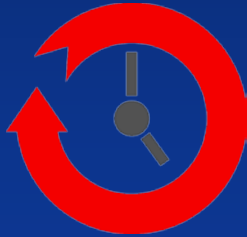
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Source: **Gartner**



DataCore Speeds up Digital Transition

Funding & Time
Constraints



- Medical Imaging
- Electronic Health Records
- Regulatory Compliance

Sample HealthCare Case Studies



1000s of Healthcare customer sites

More case studies -> <http://goo.gl/8lpZnD>

Case Study: NewYork-Presbyterian

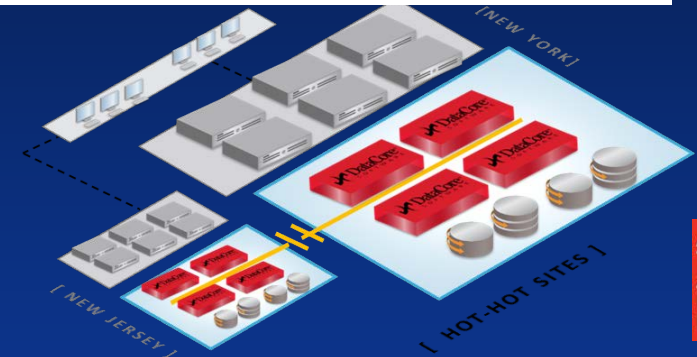


Challenges

- Downtime
(Planned & unplanned)
- Explosive expansion

Benefits

- 100% Availability
- Seamless migration
- Seamless scaling
- Seamless Data Center move



AMAZING
THINGS
ARE
HAPPENING
HERE

Capacity	> 2PB	Mirrored
Users	5000	Doctors / Nurses / Staff
Servers	300+	Dell - Windows, Solaris, AIX
Clusters	MSCS, HACMP, VMware	
Storage	EMC VNX, DMX, CX	
Years	13	4 hardware refreshes

Case Study: BlueCross BlueShield of Alabama



BlueCross BlueShield
of Alabama

An Independent Licensee of the Blue Cross and Blue Shield Association

Challenges

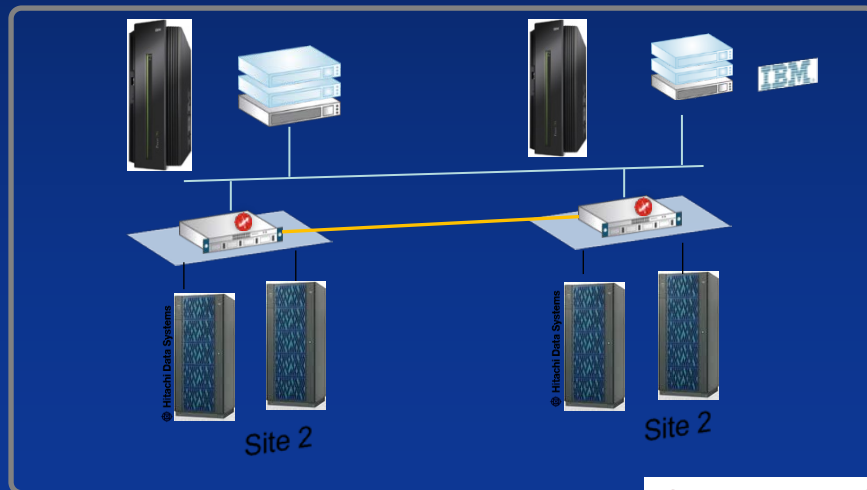
- 400TB Capacity
- High availability
- Limited budget

Solution

- DataCore SANsymphony-V
 - Dell R900 Servers
 - Hitachi VSP

Benefits

- High Availability - Metro Mirror
- Rapid implementation < 30 days
- Successful launch of BlueCloud
- Avoid Vendor Lock-in





Case Study: Southern New Hampshire Health System

Challenges

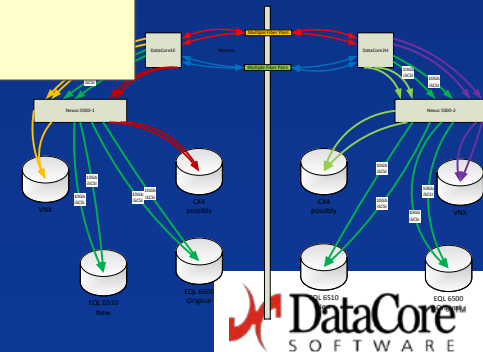
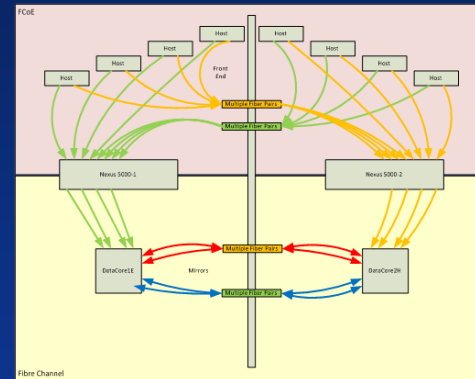
- Multiple Brands of Storage
- Additional Capacity Growth
- Downtime avoidance (metro-cluster)

Solution

- DataCore SANsymphony-V
 - Dell R720 Servers
 - EMC VNX-2 and EQL 6500 / 6510

Benefits

- High Availability - Metro Mirror
- Avoid Vendor Lock-in



Case Study: Englewood Hospital



- Reduced Downtime
- Performance Gains
- Improved IT Responsiveness
- Decreased storage-related spending

Case Study: Maimonides Medical Center

**Metro-wide
synchronous mirroring
between diverse storage**



@Hospital



**@MIS
Facility**

MAIMONIDES MEDICAL CENTER

- **24x7x365 Critical Patient Care**
- **8+ years without storage-related downtime**



"If DataCore was not in the picture we would definitely need to hire more people to maintain the storage and buy more equipment and this would mean millions of dollars that we would have to spend."

Gabriel Sandu
CTO

