



## Overview

Continuum Health Partners, Inc. ("Continuum") is a nonprofit hospital system in New York City that comprises five historically distinguished hospitals: Beth Israel Medical Center, Roosevelt Hospital, St. Luke's Hospital, Long Island College Hospital, and The New York Eye and Ear Infirmary. Continuum, like many health networks, was faced with the challenge of making their diverse storage infrastructure available around the clock, across multiple locations.

<b>IT Infrastructure using DataCore Virtualization "At-a-Glance"</b>	
Users	14,000
Capacity	>200 TB
Servers	120+
Microsoft Clusters (Metro Wide)	2

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<http://www.wehealny.org/>

## Storage Virtualization Software Continuum Health Partners

DataCore™ Storage Virtualization Software Powers an Integrated Delivery Network to Achieve Enterprise-Wide Clinical Image Consolidation at Continuum Health Partners – One of the Largest Health Care Providers in the U.S.

### Challenge: Downtime and Data Availability

A great deal of the pain and suffering that goes on at hospitals does not have to do with illnesses – but with data availability. Hospital data is truly "life and death," mission-critical information. Hospitals are mandated to keep this data – they simply can't lose it; and it needs to be highly accessible.

Moreover the data storage requirements of hospitals are climbing astronomically. Whereas 10 years ago Magnetic Resonance Imaging (MRI) and Computer Tomography (CT-scan) images may have been several megabytes, today the images are appreciably larger, ranging into the gigabytes. Every X-ray and sonogram must be stored on disk. Of course there are medical records as well that add to the enormously expanding data pool. Furthermore, hospitals are required to retain medical images of adults for seven years after they are taken. For minors, hospitals keep the medical images until the child turns 21 years old.

### Solution: DataCore Software for Multi-site Data Protection and Failover

Thanks to metro-wide storage virtualization from DataCore Software, Continuum now has many of their imaging systems and three of their principal IT facilities running on metro-clusters.

Metro clusters comprise multiple distinct computer systems capable of taking over for each other despite being separated geographically over metropolitan distances of 10-20 miles.



"Our goal here was to deploy a system that would allow us to achieve high availability and business continuity for all of our clinical systems," states Jill Wojcik, IT Director, Continuum Health Partners. "Since we have implemented this, we have not experienced any downtime - even for system maintenance."

**Microsoft solutions deployed by Continuum Health Partners that are part of the DataCore virtualized infrastructure:**

- Microsoft Windows Server 2008 R2
- Microsoft System Center Configuration Manager (SCCM)
- Microsoft SQL Server
- Microsoft Cluster Servers (MSCSs)

The major technical challenges arise in trying to maintain separate mirrored copies of data at each site without incurring downtime when switching between them. DataCore makes that possible. Synchronously mirroring data between two sites in different buildings, on different power grids, on different flight paths, on different flood plains, and with different employees, ensures that data is continuously available even in the event of site-specific outages.

DataCore synchronously mirrors the PACS (Picture Archiving and Communications Systems) images from Beth Israel Medical Center and Roosevelt Hospital in New York to Continuum's data center in Secaucus, New Jersey.

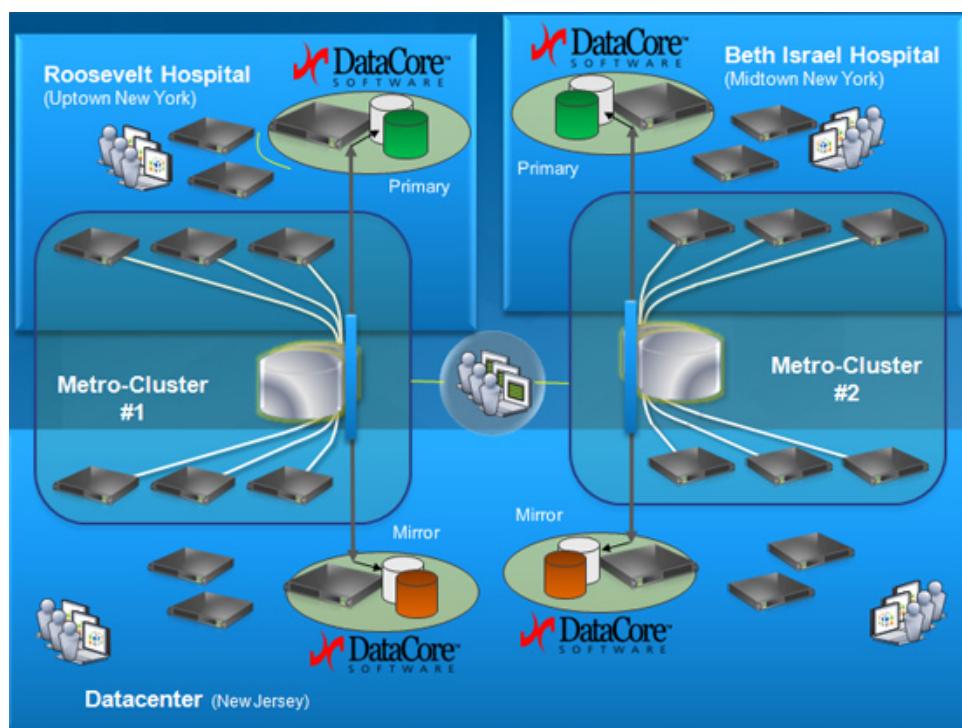
DataCore software runs at each hospital and communicates with its mirrored counterpart at the central data center, where the rest of the organizations' data is also stored.

Either of these installations can automatically fail-over to the other "hot site." When one side of the cluster goes down – the other side comes up; and that happens at the application-level, seamlessly.

The hospitals replicate their images to the data center using Fibre Channel protocol over separate "dark" fiber pairs at a rate of 200 megabytes (MBs) per second. A Verizon DWDM (Dense Wave Division multiplexer) Metropolitan Area Network (MAN) provides full loop connectivity ensuring two diverse paths for each connection.

## IT Landscape

The metro-clustered IT infrastructure at the two Continuum hospitals ensures business continuity, with DataCore storage virtualization software at the center of it.





Roosevelt Hospital

In this deployment, the application servers are clustered and their disks are also redundant. Should the system go down at the core data center, the applications can failover to the hot site to provide the user community continuous access to their applications.

Continuum runs the DataCore SANsymphony™ software at the two hospitals and at the central data center on IBM x3650 servers. The combination is known as a DataCore storage virtualization node. Each node has eight Fibre Channel ports transmitting at 8 Gbps. Over 20 trays of IBM 32-port, 8 Gbps switches make up the storage area network (SAN) topology. For backend disks, the DataCore nodes control IBM DS 4800 and DS 5100 storage subsystems. An additional pair of DataCore nodes manages the SAN at Long Island College Hospital – separate from the metro-clusters.

To top things off, both the Roosevelt Hospital and the Beth Israel Medical Center take advantage of DataCore™ CDP (Continuous Data Protection) software for the hosted images to rapidly rollback to an earlier point in time.

Continuum also employs DataCore software to virtualize the storage pool for their file and print infrastructure, as well as all other newly implemented clinical

systems. Whereas PACS relies on IBM storage devices on each side of the cluster, DataCore mirrors disks for network attached storage (NAS) and print servers between Xiotech and IBM storage devices.

In total, DataCore SANsymphony software virtualizes and manages well over 200 TBs (collectively) for the various hospitals in the Continuum network. The environment supports a community of 14,000 users using over one hundred and twenty (120) servers.

## Results

The IT team at Continuum is quick to cite DataCore's hardware-independence as a key benefit for the hospitals that make up their health care network, enabling unprecedented flexibility. They were initially able to re-purpose existing IBM storage assets for the disk pool on one side of the cluster. Then subsequently added to the mirrored storage pool with new IBM hardware.

However, the overarching benefit of this implementation has been unprecedented high availability. The key to this is that the data resides on geographically separated 100% mirrored systems. Now, cluster continuous replication (CCR) splits the storage between two locations – where one set of disks resides at the data center and one set resides in a "remote" hospital.

Continuum has effectively eliminated the need to do traditional disaster recovery should a calamity happen. Whereas many IT organizations normally go through a painful process of assembling resources to recover data following a site-wide outage, the metro clusters at Continuum Health Partners allow them to take over operations from their hot site uninterrupted.



Beth Israel Medical Center

## **Bottom-line**

"With specific reference to the PACS images, before this metro-clustering initiative these systems had their own support people at the various hospitals and were pretty much autonomous systems," explained Wojcik. "We have brought this in and have centralized the systems now in our central data center – using DataCore™ software running on top of the various hardware solutions."

Prior to using DataCore, Continuum did not have a system that was highly available. The storage for the PACS images was local to each server.

A very tangible benefit of this metro cluster environment has to do with system maintenance. System maintenance can now be done without any interruption to the user community.

"With DataCore in place and with hardware in two different locations, this has allowed us to make our mission-critical, clinical imaging along with other systems highly available," Wojcik commented. "Since we have implemented this, we have not experienced any downtime – even for system maintenance."

**For more information on storage virtualization, please visit:  
[www.datacore.com](http://www.datacore.com)**

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