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*Richard Carter
 Lead Storage Engineer
 Seattle Children's*



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INDUSTRY Healthcare

SOLUTIONS **Enterprise Platform, File and Content, Modular Platform**
Hardware — Hitachi Virtual Storage Platform, Hitachi Adaptable Modular Storage 2100, Hitachi NAS Platform 3080, powered by BlueArc®
Software — Hitachi Dynamic Tiering, Hitachi Tiered Storage Manager, Hitachi Command Suite, Hitachi Tuning Manager
Services — Planning, design and deployment services provided by Hitachi Data Systems Global Solution Services

At the Heart of Seattle Children's Mission-critical VDI Deployment Pump Hitachi Storage Technologies

Seattle Children's is a highly specialized hospital, research and foundation group responsible for saving lives and improving health-care for children. To ensure reliability for its 24/7 virtual desktop infrastructure (VDI) deployment, Seattle Children's relies on the centralized simplicity, performance and versatility of Hitachi Virtual Storage Platform and Hitachi NAS Platform*¹.

Three words capture the focus of Seattle Children's: hope, care, cure. For more than 100 years, the hospital has specialized in meeting the unique physical, emotional and developmental needs of children, from infancy through young adulthood. Ranked among America's best children's hospitals by *U.S. News & World Report* magazine, Seattle Children's provides world-class clinical care with nearly 60 pediatric subspecialties, and is internationally recognized for pioneering pediatric medical research and achieving extensive grant funding.

With a 254-bed facility in Seattle, Washington, as well as several additional outlying care and research locations, Seattle Children's serves a 4-state area. Expansion plans will bring a new hospital wing by 2013 with another 80 beds for cancer and critical care patients and a new Emergency Department. Seattle Children's employs over 4,900 highly trained

physicians and medical professionals, and functions as the primary teaching, clinical and research site for top ranked University of Washington School of Medicine's Department of Pediatrics.

Wanted: Best-of-class VDI Deployment

Seattle Children's is an exceedingly progressive healthcare organization, delivering the utmost critical services and diagnostics. Ensuring uninterrupted access to its information is equally vital. Patient records, cutting-edge research data and transactional accounts must be available anywhere, anytime across this constantly changing and growing healthcare entity.

The IT department at Seattle Children's supports more than 800 server systems, both physical and virtual, and applications dedicated to the unique nature of medical

subspecialties. These include all flavors of Microsoft Windows, IBM® AIX® and z/OS®, Linux, OpenVMS, XenServer and VMware. Additionally, IT manages a 5,500-strong personal computer environment and the data for the hospital's overarching operational systems, including Cerner clinical, Epic revenue and patient systems, GE picture archiving and communication systems (PACS), and Microsoft Exchange Server. The organization has a primary data center as well as a smaller center used for proof-of-concept efforts and disaster recovery.

When the IT department embarked upon an enterprise-wide VDI strategy, the goal was to incorporate best-of-class hardware, software and networking gear to ensure a flawless deployment. Cisco SAN switch fabrics, including Cisco MDS 9509 Multilayer Directors, and end-to-end Citrix VDI components from hypervisor to virtual image, including XenDesktop and XenServer, lay the foundation for a high-performance virtualization environment. As it came time to consider storage, the IT department needed to replace a legacy storage system with newer technologies, simpler administration and the highest I/O available.

"When we jumped with both feet into this level of critical VDI project, we went with the best in class for all components, including storage. We wanted to look at storage from a 'greenfield' perspective: a targeted, uncomplicated solution that would deliver rock-solid reliability for

¹Hitachi NAS Platform is powered by BlueArc®, which was recently acquired by Hitachi Data Systems.



"We wanted to look at storage from a 'greenfield' perspective: a targeted, uncomplicated solution that would deliver rock-solid reliability for the VDI [virtual desktop infrastructure] initiative as well as future data growth."

Wes Wright
Vice President and CTO
Seattle Children's

the VDI initiative as well as future data growth. We chose Hitachi Data Systems for outstanding reliability, performance, technologies and price,” says Wes Wright, vice president and chief technology officer at Seattle Children’s.

Superior Solution Simplifies and Unifies Storage

Hitachi Data Systems became the storage partner of choice for Seattle Children’s VDI endeavor only after thorough and meticulous investigation of potential solutions. The IT team at Seattle Children’s spent time talking with Gartner senior analysts, making reference calls and engaging Advanced Systems Group to further vet possible choices and vendors. Advanced Systems Group is a national open systems integrator and consulting services company that focuses on providing customized and comprehensive solutions for Fortune 500 companies with mission-critical business applications.

Seattle Children’s selected Hitachi Virtual Storage Platform (VSP), an economically superior storage architecture designed to swiftly address dynamic data environments with one platform and many cost efficiencies. “The Hitachi solution was able to meet all our needs for the VDI project as well as the larger vision for centralized storage and disaster recovery. We wanted the potential for data center consolidation, the ability to reduce management tools and a way to seriously uncomplicate the storage environment,” says Wright.

Hitachi Data Systems Global Solution Services was involved in the planning and design of the storage solution and helping with the virtual desktop deployment. “The Hitachi staff helped with disk layout, usage, designing dynamic pools and tiering, configuration, storage virtualization, and [they] provided top-notch knowledge transfer for all the software features,” adds Richard Carter, lead storage engineer for Seattle Children’s.

A Healthy VDI Initiative

Seattle Children’s installed Hitachi Virtual Storage Platform in its primary data center to function as the centralized storage solution. A portion of this centralized storage is delivered via a dual-node Hitachi NAS Platform (HNAS) 3080 cluster. To simplify the Seattle Children’s Citrix VDI server environment, which requires both block (SAN) and file (NAS) based storage, HNAS 3080 provides the dual-enterprise support capability via a single platform.

“Citrix uses its own provisioning services to handle read images. This creates a pool of servers, but not a cluster, so we had all these discrete servers. We wanted a file service device in place to read a common image rather than read from each server. The HNAS 3080 offered us very high performance and reliability to present read images and really simplifies administration of those shared images,” Carter says.

The Seattle Children’s VDI implementation will eventually reach 5,000 users. To date, 2,000 thin client and zero client VDI devices have been deployed. As each virtual desktop device boots up, it pings VSP in the primary data center to obtain its virtual image.

At its secondary location, Seattle Children’s installed a VSP in front of a Hitachi Adaptable Modular Storage 2100 (AMS 2100). This allows storage to connect through the VSP and access the virtualization layer, thereby facilitating a single common replication solution for addressing disaster recovery. Hitachi Universal Replicator software assists with simplified asynchronous data replication across internal and externally attached storage for resilient business continuity without the need for redundant servers or replication appliances.

Hitachi Virtual Storage Platform provides 3-dimensional scaling to dynamically scale up, out and deep. VSP uses Hitachi Dynamic Tiering to manage external storage resources as a whole and dynamically

move data throughout virtual tiered storage for block, file and content data. Combined with Hitachi Command Suite v7, which delivers a comprehensive management suite for this environment, VSP helps Seattle Children’s unify and simplify administrative tasks across the storage enterprise for the highest levels of operational efficiency.

“Now, we can scale extensively and simply, going deep by externalizing storage, wide with our drive count and up for performance with the capabilities of the processors. And the Virtual Storage Platform lets us go to very granular levels so we can grow as needed and better meet planning horizons and grow to meet future needs,” says Wright.

To further orchestrate a highly efficient data pattern for VDI access, Seattle Children’s had its VSP configured with varying performance-level disks, including SAS for mostly supporting the HNAS-to-Citrix servers, and solid state disks (SSD) to sustain hot blocks for the most frequently accessed data. “At this level of data storage demands, there could be hundreds of hard disks required to service all the performance requirements. Using Dynamic Tiering, we were able to create a very efficient and suitable mix of storage disk on the Virtual Storage Platform to substantially reduce the cost per virtual desktop while ensuring optimized data access across the VDI user environment,” says Carter.

Seattle Children’s is also using path-aware Hitachi Tuning Manager for end-to-end visibility and performance management, to view status, create daily reports and stay atop expansion thresholds. “Tuning Manager keeps us very much apprised of current situations, so we know where the VDI is at any given time. Testing had shown that each virtualized desktop consumes about 12 I/O: that’s about 12,000 I/O per 1,000 machines. We will grow to 6,000 virtual desktops, and this Hitachi environment gives us confidence that we’ll have no problems sustaining VDI,” Carter furthers.

Hitachi Tiered Storage Manager joins the software lineup on VSP for easy execution of volume-based movement of data according to policy and value, helping to optimize storage utilization. “We don’t always know exactly what a new system might need. Tiered Storage Manager allows us to adapt to the final requirements of the system and make adjustments throughout the system’s lifespan. With current storage, we might later need to move it to or from mission-critical storage tiers, or adjust the performance and availability as roles change. It only takes a couple of minutes to schedule migrations between AMS 2100 and VSP internal storage, or to go from midrange quality to Tier 1 performance,” Carter continues.

One Platform, Many Efficiencies

Since deploying the Hitachi solution, the Seattle Children’s IT department has already realized many of its goals. “We wanted to ensure that we could operate a dynamic 24/7 environment with zero disruptions to our customers. With the previous environment, it was such a coordination effort to handle the effects of change. Now, we have a highly resilient and efficient IT enterprise that allows us to take on big changes without the worry of sustaining them. The VDI implementation has had a huge impact

to our end users and the Hitachi package is definitely part of that success,” says Wright.

“And of course data storage continues to grow, and keeping up always has its challenges. We anticipate 35% storage data growth per year, stored in state, and we’re heading toward half a petabyte of managed storage. Before the Hitachi solution, we had to manage the licensing of different software in different places, managing discrete solutions and new feature sets, and wanted to get away from that model. When we virtualized behind the Virtual Storage Platform, we gained a single centralized licensing center, one set of tools to manage tasks and one refined enterprise-ready replication solution — one platform to do it all,” adds Carter.

From a cost-efficiency perspective, Carter cites a lower total cost of ownership for the Hitachi products than other solutions considered. “We embedded the storage requisition in the overall VDI project costs, and the return on investment for the VSP has shown very well. But the biggest returns so far have been on operational costs, such

as maintenance and cost containment, and about 50% less footprint, cooling and power consumption costs, along with 65% less for the AMS 2100. And since we now have centralized storage operations through the VSP, we don’t have to hire additional storage staff. We’re doing far more work with fewer resources. We’re also able to put highest performance where we need it, and everything else on a more affordable tier,” he details.

Carter considers the storage environment to still be in a transitional period, as migrations are completing and other initiatives are in flight. “We have all of these next-generation technologies and feature sets under an overarching storage umbrella. This allows us to operate a Tier 1, very highly available device many times easier than we did before. And we haven’t yet begun to realize the full potential of the benefits provided by the Virtual Storage Platform,” he concludes.



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