

University Implements Virtual Solution to Enhance Medical Program



Boston University/Boston Medical Center uses Unified Computing System to enhance biomedical research and teaching.

Executive Summary

Boston University / Boston Medical Center, Department of Medicine

- **Industry:** Higher Education
- **Location:** Boston, MA
- **Number of Employees:** >10,000

CHALLENGE

- Centralize management of unique, research-specific applications
- Increase hardware performance to sustain collaborative medical research endeavors
- Requirement to stay within budget

SOLUTION

- Enable desktop virtualization by integrating Cisco Unified Computing System

RESULTS

- Unprecedented level of application management flexibility
- Facilitated collaboration with researchers outside of the University
- Overall improvement in the ability to conduct critical medical research

Challenge

Boston University Medical Campus (BUMC), comprising Boston University School of Medicine, School of Public Health, School of Dental Medicine as well as the affiliated Boston Medical Center is a large academic medical center and top research institution. BUMC conducts intensive translational research, multidisciplinary biomedical research, including basic sciences such as dermatology, immunology, and pathology as well as educating graduate and medical students, post-doctoral fellows, and medical residents and fellows. To complete quality translational research, BUMC researchers utilize highly technical research-centric computing resources coupled to multimillion-dollar research instrumentation and facilities.

To an increasing degree in 2011, researchers in the Department of Medicine (DOM) were finding that technology infrastructure improvements were needed within the campus data centers. The existing platform, originally built for standard office computing and storing electronic records, was not equipped to handle the digital needs of modern research and DOM's daily massive production of research data. The existing technology was slowing research efforts, making it difficult to manipulate research-specific applications such as high-performance image analysis. John Meyers, Director of Technology for the Department of Medicine, says, "As a practicing scientist and IT director, I was very frustrated, as were my colleagues, at that lack of a central application management system."

In addition, with no data backup or central management capabilities, data loss in labs was frequent, and data security was being compromised. Dr. Meyers says, "We [the DOM administration] heard horror stories of entire labs losing entire years of research. There was no central support for research computing."

DOM needed a solution that would enhance the performance of its hardware and management of its applications. Desktop virtualization was the clear solution to address the challenges. However, because DOM central technology was funded through an endowment, its budget for technology upgrades was limited, a common challenge for research centers.

Solution

To tackle DOM's challenges, Cisco proposed integrating a robust virtualization platform that could be centrally managed: the Cisco Unified Computing System™ (UCS™), a converged data center platform. For Dr. Meyers, in his role as IT director, the prospect of efficient data center management and automation was intriguing. "The more I learned about UCS, the more I liked it," he says. After careful comparison to an industry competitor, the Department of Medicine chose Cisco to meet the research center's needs in performance, management, and cost savings. "Cisco

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John Meyers

Assistant Professor of Medicine and
Director of Technology, Department of
Medicine (DOM)

gave fantastic on-site training to my staff,” Dr. Meyers says. “It was the best training out of all the vendors.”

In August 2011, Cisco integrated UCS B-Series servers (B-200) at BUMC, including eight Blade Servers and two Cisco Nexus® 5000 Series switches. Particularly impressive to DOM was the performance capabilities that the Cisco® Nexus 5000 switches offered. “I’m delighted with the 5000 series switches,” Dr. Meyers says. “In terms of simplicity, I didn’t want separate fabric and network switches. I love the fact that you can turn any port into a fiber channel or Ethernet switch. It’s so easy to manage.” Likewise, the UCS B-series servers met BUMC’s limited space constraints. “When it came down to actual computing, my biggest issue was that I share data center space with other large IT groups,” says Dr. Meyers. “Using Blade Servers was the ideal solution for my space constraints.” DOM’s technology department also has a limited number of staff, so they needed to be able to maximize human resources. The UCS service profiles allowed Dr. Meyers and his team to move the Blade Servers easily, thereby not having to waste time on setting up complex equipment.

The Department of Medicine’s research environment is a complex path, often beginning with scientists working with cells in the lab and ending with complex computational analysis of data collected via imaging, analytical, DNA sequencing, or other scientific methods. UCS had the capability to simplify and quicken application deployment to support the constantly changing research mission in virtualized environments, delivering unified management and migration support while increasing reliability and security. In addition to Cisco UCS, the Nexus 5000 Series switches facilitated instructional simplicity and enabled transport over Ethernet on one common data center platform, helping to prepare DOM for its role as an evolving data center. By providing a new foundation of data stability, the improved technological capabilities have allowed researchers to improve their productivity, furthering biomedical research at DOM.

Results

Prior to deploying Cisco UCS, DOM had to purchase individual servers for each application in use, since servers are traditionally built to be application-specific. As such, repurposing the application-specific hardware was expensive and time-consuming. Today, UCS enables Dr. Meyers and his staff to re-profile DOM hardware from one server to another in a matter of minutes, giving them an unprecedented level of application management flexibility. This flexibility has enhanced application performance, thereby directly facilitating the speed and ease at which medical research is conducted at DOM.

Isilon Systems, a division of EMC and a Cisco partner, supplied a multi-tier scale-out NAS storage cluster that was deployed concurrently with the UCS hardware. The Isilon cluster acts as the repository of all research data and delivers the performance

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Product List

ROUTING AND SWITCHING

- Cisco Nexus 5000 Series Switches

NETWORK MANAGEMENT

- Cisco Unified Computing System B-Series Blade Servers
- Cisco Vblock Infrastructure Platforms

necessary for high-performance computing, as well helps ensure sufficient data protection, archival capability, and enormous modular scalability. Utilizing the UCS's internal quality of service (QoS) and virtualized NIC provisioning, virtualized applications within the UCS environment are guaranteed high-speed access to the research datasets via network file server (NFS) or server message block (SMB). The partnership between Cisco and Isilon has resulted in a purpose-built environment tailored to the needs of academic research.

Using Cisco UCS, DOM is able to manipulate research applications and the corresponding hardware profiles easily and efficiently. The time saved by being able to control research applications maximizes the hardware platform investment, a significant plus for organizations dealing with budget constraints. Having these flexible technology capabilities in a research environment is powerful. The Cisco solution is scalable, so it will continue to facilitate future additions of applications at DOM. Dr. Meyers notes that his team has already received "rave reviews" from research colleagues throughout the organization: "For the first time, they're [researchers] saying, 'Wow, it's actually fast and reliable!'"

On an even wider scale, UCS has facilitated collaboration between different research institutions, ranging from other peer institutions in Boston to tuberculosis researchers operating in Africa. Using Cisco UCS hosting portals, DOM researchers are able to provision secure file transfer protocols with researchers outside of the organization and smoothly share enormous quantities of data with each other, including experiment results and analysis. For the first time, DOM researchers are able to virtually collaborate with medical researchers outside of the institution, whether nearby at Harvard University or internationally, ultimately enabling potentially groundbreaking medical research and training. By leveraging DOM's UCS system, a BU-affiliated team of researchers stationed in developing nations around the world can push tuberculosis data back to the centralized research storage located on campus, enabling researchers scattered throughout the globe to analyze and communicate data in real-time, ultimately leading to progress of critical research ventures.

For More Information

To learn more about Cisco UCS B-Series Blade Servers, go to <http://www.cisco.com/go/ucs>.

To learn more about Cisco Nexus 5000 Series Switches, go to <http://www.cisco.com/go/nexus>.

To learn more about Cisco Vblock Infrastructure Platforms, go to <http://www.cisco.com/go/vblock>.

