

Clinical Studies Provider Redefines Business Agility



Executive Summary

- **Customer Name:** MPI Research
- **Industry:** Life Sciences
- **Location:** Mattawan, Michigan; State College, Pennsylvania
- **Number of Employees:** 1200

Challenge

- Manage large amounts of research data
- Accelerate project research and team collaboration
- Reduce IT costs and overhead

Solution

- Build virtualized data centers with Cisco Unified Computing System
- Integrate with end-to-end Cisco network and existing storage
- Use UCSM for single-pane-of-glass network, server, and storage management

Results

- Reduced time required for provisioning of new server and database resources by 80 percent
- Increased performance by 35 percent for both applications and operating systems
- Streamlined data center management by 120-to-1 ratio

MPI Research uses Cisco UCS for data centers that respond faster, maximize IT, and enhance end-user access.

Challenge

The development process for drugs and medical devices begins long before products ever move into clinical trials. MPI Research, one of the largest preclinical contract research organizations in the world, works with pharmaceutical, biotech, medical device, and chemical companies to conduct customized preclinical research throughout the discovery and development process, from early proof-of-concept testing, and reports the required research results to multiple regulatory agencies worldwide.

MPI Research plays a crucial role in meeting customer requirements for fast time-to-market, security of intellectual property, and clinical accuracy. To meet these needs, MPI relies on state-of-the-art technology, including large databases and proprietary applications, to power its operations.

At two locations in Mattawan, Michigan and State College, Pennsylvania, 1200 employees, including hundreds of in-house researchers, conduct an array of studies on everything from immunology and general toxicology to environmental safety testing on behalf of clients. They require massive compute power to process large research studies, and they generate extreme amounts of data. Currently, the company's data volumes are about 70 terabytes. For MPI Research, effective management of data is paramount.



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– Michael Broyles
Systems Engineer
MPI Research

In addition to the need for large-scale computing resources, MPI Research requires processing agility to help its clients speed new product development and ultimately time to market. New studies or tests must begin within days, not months, and this requires provisioning servers, storage, and network resources to accommodate rapid fluctuations in demand. Schedules must be adjusted readily, and results delivered quickly.

Security and data redundancy are also major concerns. “MPI Research is in the data business; we must safeguard our clients’ intellectual property that may lead to the next life-saving drug, chemical, or medical device, as well as comply with the data integrity regulatory requirements of agencies such as the Food and Drug Administration (FDA),” says Mark Malloy, head of IT at MPI Research.

“We need 99.999 percent availability, high performance, and extreme flexibility. Our list of technology requirements is long,” says Michael Broyles, systems engineer for MPI Research. “We wanted an end-to-end network and data center solution to support our stringent requirements.”

Solution

After evaluating several vendors, MPI Research chose a Cisco network, implementing it from top to bottom across the company’s two data centers. “When we conducted a side-by-side comparison, every person on our technical team agreed that the Cisco solution best met our business needs,” says Frank Misak, network engineer at MPI Research. Unique advantages were the proven reliability and performance of Cisco solutions and superb technical support, as well as reliability, built-in redundancy, and end-to-end functionality including voice telephony.

As part of its efforts to transform its data center and network infrastructure, MPI Research embarked on a comprehensive project to renew its aging virtualization technologies and update server hardware. For years, virtualization has been an important feature of company operations. Instead of procuring and provisioning physical servers, which can take six to eight weeks and delay studies, MPI Research found it was far more efficient to deploy virtual servers and required resources (databases, storage, and network bandwidth) from a secure, private cloud, drawing from shared technologies in the company’s two data centers. The initial virtualization project paid for itself in eight months, but the company wanted to do more.

As the foundation for its virtualized, next-generation data centers, the company chose the Cisco Unified Computing System™ (UCS™), which unifies network, compute, storage access, and virtualization into a single, cohesive system. After investigating the high-performance capabilities of Cisco® UCS servers, MPI Research purchased 15 Cisco UCS C200 series high-density, rack-mount servers, 9 Cisco UCS B200 M2 Blade Servers, and 7 Cisco UCS B230 M1 Blade Servers, all connected through a high-capacity Cisco Nexus® switching environment that also leverages 4 Cisco UCS 6140XP Fabric Interconnects. “By leveraging the Cisco UCS design concepts and vast integration of hardware and software technologies, we were able to reap significant savings in areas such as power consumption, reduced licensing costs and a dramatic reduction in the number of sockets in use,” says Broyles.



Built from the ground up for virtualization

According to the IT team, Cisco UCS was a natural choice. It included built-in support for VMware, and was unique in its ability to integrate storage, network, and UCS server resources into a unified whole, managed from a single pane of glass. “When it comes to data center virtualization, Cisco UCS hits the ball out of the park,” says Broyles. “Overall the Cisco UCS solution provided us with greater scalability and flexibility as well as the ability to become more innovative in developing and providing infrastructure solutions that offer superior value.”

Today, the Cisco UCS servers are virtualized, using VMware ESXi hypervisor and managed with Cisco Unified Computing System Manager (UCSM), making it fast and easy for the IT team at MPI Research to divide computing pools into virtual resources for research studies. Instead of deploying new physical servers, the team can deploy and move UCS service profiles (software files containing specific server configurations such as storage and networking characteristics) to available portions of physical server blades.

To streamline management of its virtual environment and optimize performance, MPI Research is using Cisco Nexus 1000V Series Switches with the Cisco Nexus 1010 Virtual Services Appliance as part of its comprehensive virtual services platform. The Cisco Nexus 1000V Series includes the Virtual Ethernet Module (VEM), which is a software switch embedded in the hypervisor and the Virtual Supervisor Module (VSM) to manage network policies and quality of service for virtual machines along with VEM. The Cisco Nexus 1010 delivers several advantages, including the flexibility to manage policies separate from VMware virtualization administrators, simplifying compliance and reducing administrative errors.

“Combining Cisco Nexus 1000V switches and the Nexus 1010 Virtual Services appliance enables us to rapidly deploy new assets and provision resources to keep up with changing business demands, with no interruption to services,” says Broyles. “The solutions are integral to enabling our successful virtualization strategy.”

As part of the virtualized environment, a NetApp storage-area network (SAN) and Hitachi Universal Storage Platform VM (USPV) are virtualized and can be allocated on demand. And, for general business productivity, MPI Research hosts over 100 Citrix servers for applications such as Microsoft Office and Microsoft SharePoint.

Results

IT resources ready to use

When clients come to MPI Research, they can be confident that their preclinical studies will be completed quickly, reliably, and securely. High-performance technical resources to support studies can be provisioned in the Cisco UCS environment within hours versus weeks, creating a competitive advantage for MPI Research and its customers. The strong performance and reliability of Cisco UCS helps ensure that analyses related to studies are completed quickly and that no gaps occur in service delivery. Because MPI Research uses virtual machines managed using Cisco UCS, tracking the status of computing resources for reporting to the FDA and other agencies can be done with ease, without having to gauge the status of physical servers.

“So far we’ve seen approximately a fourfold boost in performance by using virtualization on the Cisco UCS hardware when compared to previous physical systems. System monitoring has verified that overall Application and Operating System responsiveness has more than tripled,” says Broyles.

Product List

Data Center Solutions

- Cisco UCS B200 M2 and B230 M1 Blade Servers
- Cisco UCS C200 M2 Servers
- Cisco UCS 6140XP Fabric Interconnects

Routing and Switching

- Cisco Nexus 1000 Series Switches
- Cisco Nexus 7000 Series Switches
- Cisco Nexus 2232PP 10GE Fabric Extender
- Cisco 7600 Series WAN routers
- Cisco 7200 Series Services Aggregation routers
- Cisco 3750 Series Access Switches

Network Management

- Cisco Unified Computing System Manager

Security and VPN

- Cisco Adaptive Security Appliances (ASA)
- Cisco IDS

IP Telephony

- Cisco Unified Communications Manager
- Cisco Unity®
- Cisco MeetingPlace®
- Cisco Emergency Responder (CER)
- Cisco Mobility
- Cisco VG224 Analog Voice Gateways
- Cisco ISR2800 Series Routers

Single-pane-of-glass management

The overriding management benefit is the ability to manage server, storage, and network resources from a single pane of glass using UCSM and enabling a small team of three people to manage hundreds of virtual machines: the same number of staff that previously was required to manage a handful of physical servers. “By providing a single unified view of our data center network health, Cisco UCS provides us with the end-to-end visibility required to help ensure end users are experiencing consistent, high-quality communications, while enhancing security within a single system,” says Broyles. Broyles also notes how UCSM delivers a single focal point for administration and a single view into the environment while reducing the number of troubleshooting points when problems may arise. It also helps streamline training, because it reduces the number of courses or training materials needed to maintain and support the infrastructure.

For MPI Research, another important consideration is Cisco support of boot-from-SAN, in which servers boot from volumes on the NetApp SAN. With these tools, the IT team at MPI Research can store server images, including applications, operating systems, settings, and data on the SAN and administer and parse them out from a single location. “With Cisco UCS, we can have storage, network, and server staff all on the same page,” says Misak. “All three teams can use a single administration tool to efficiently coordinate provisioning and administration.”

Reduced costs, increased services

Costs are reduced, because MPI Research has been able to consolidate server clusters from three (one for production, and two others for development and Citrix application hosting) to one cluster to maximize utilization. “By consolidating resources, we’ve uncovered significant savings,” says Broyles. “Instead of managing a number of clusters, we can manage just one using Cisco UCSM. The visibility we’ve gained with Cisco has also enabled us to prune unused and unnecessary virtual machines to free up additional compute power.”

With Cisco technologies, the company can provide resources to support studies in hours, and that means all the difference for clients looking to deliver breakthrough pharmaceutical or biotech products to market as quickly as possible. “The word ‘nimble’ has consistently been part of our vision statement,” says Misak. “With Cisco UCS and UCSM, we’re at the cutting edge of being able to manage high-performance data centers to meet our demanding business requirements.”

For More Information

To find out more about Cisco Unified Computing, visit: www.cisco.com/go/ucs.

To find out more about Cisco Unified Data Center, visit: www.cisco.com/go/unifieddatacenter.



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