Customer Case Study

University Sees Major Savings with Data Center Consolidation

Executive Summary

- **Customer Name:** University of Colorado
- **Industry:** Education
- **Location:** Boulder, Colorado, US
- **Number of Students:** 57,361
- **Number of Employees:** 24,000

Challenge

- Manage and maintain multicampus IT environment despite reduced budget
- Shrink data center footprint to lower power and cooling costs
- Operate data center with fewer staff and resources

Solution

- Cisco Unified Computing System (Cisco UCS) provides easy-to-manage server platform
- Cisco UCS B-Series Blade Servers with Intel Xeon processors support virtualization and mission-critical workloads
- Cisco Nexus 1000V Series Switches and Cisco Nexus 1010 Virtual Services Appliances enhance virtualization with robust security

The University of Colorado saves $600,000 per year by migrating from Sun SPARC servers to Cisco Unified Computing System.

Challenge

Founded in 1876, the University of Colorado is a leading research university that facilitates research for federal government agencies, including the National Aeronautics and Space Administration (NASA), the National Institute of Standards and Technology (NIST), as well as the National Institutes of Health (NIH). With a flagship campus in Boulder, along with two sister campuses in Denver and one in Colorado Springs, the university offers 80 majors at the bachelor's level, 70 at the master's level, and 53 at the doctoral level.

University Information Systems (UIS) is responsible for the development and operation of the school's multicampus administrative information system. In 2009, UIS was faced with further cuts to an already tight budget, forcing the group to reevaluate its existing infrastructure. "We had scaled our data center in a horizontal fashion, and we had reached the limit of what we could power and cool in our existing data center," says Keith Lard, director of Enterprise Cloud Services for UIS.

In addition to technical limitations, UIS also had issues from a management perspective. "With a reduced budget, we could no longer staff the number of people it took to run our data center," says Lard. "So we launched a data center consolidation and virtualization project, hoping that by reducing our footprint, we could host this technology externally."

Executive Summary, continued

Results

- Reduced data center footprint by 96 percent, power consumption by 90 percent
- Saved $600,000 from total IT budget first year after RISC migration
- Improved enterprise resource planning (ERP) Oracle application performance by 400 to 600 percent, while easing server management

"Cisco UCS opened our eyes to what we can accomplish. This really is the technology of the future."

– **Keith Lard,**
Director of Enterprise Cloud Services, University Information Systems, University of Colorado

Solution

Although virtualization was important, UIS was primarily concerned about finding a server solution that ensured optimal performance and reliability for its numerous mission-critical applications. These include Oracle and PeopleSoft applications, as well as an electronic research administration system and a business intelligence suite from IBM called Cognos.

Of course, easing management was also a major criterion, which Cisco addressed with its Cisco Unified Computing System™ (Cisco UCS™). "For me, the 'aha' moment came when I saw how Cisco UCS Manager allows you to control and configure the environment from a single interface," says Lard. "This way, we would only have to train our staff on one system and could develop expertise much quicker."

Thanks to assistance provided by Intel and Cisco, UIS was able to deploy a number of Cisco® UCS B-Series Blade Servers, including the B440 with Intel® Xeon® 7500 Series and E7 family processors for maximum performance and capacity, as well as B250, B230 and the B200 models with Intel Xeon 5500 and 5600 series processors for dense virtualization. The improved reliability, availability, and serviceability (RAS) capabilities of the Xeon 7500 and E7 processors, in particular, support the mission-critical platform the university needs for its workloads.

UIS chose VMware for its virtualization technology, along with Cisco Nexus 1000V Series Switches and Cisco Nexus 1010 Virtual Services Appliances. The Cisco Nexus 1010 provides UIS with enhanced network monitoring and reporting capabilities, which contributes to enhanced security and evaluation of the user experience. This combined with Intel Virtualization Technology (Intel VT) helps improve virtualization performance and density, accelerate deployment, boost security, and make it easier to migrate workloads across multiple generations of Intel Xeon processors through its integration with Cisco UCS.

"We were able to take our virtualization footprint from 15 percent to 95 percent over about a three-week period using Cisco UCS technology," says Lard. "And we were easily able to migrate from our legacy Sun SPARC and Solaris environment to the UCS infrastructure, which today runs Red Hat Linux. With Cisco's VMware design expertise, the RISC [reduced instruction set computing] migration included most of our installed Oracle products as well."

Cisco UCS has set numerous Oracle benchmark world records and is certified by Oracle for its entire software and database stack. These benchmarks and certifications are especially valuable to the UIS team, as its Oracle implementation supports many essential administrative functions.

In addition to reliable Oracle support, the Cisco UCS B-Series Blade Servers combine energy-efficient technologies from Cisco and Intel. Intel Xeon processors automatically adjust server performance to meet application needs while reducing energy consumption during periods of lower demand.

Results

The platform is currently running approximately 140 virtual machines in production and roughly 160 in development. UIS consolidated its previous 300 servers on 24 racks down to 10 total servers on Cisco UCS that are now consolidated into two racks. This reduced the university's data center footprint from approximately 5000-square feet to 200-square feet, not to mention its power and network cabling by 1000 cables.

"After moving to UCS, we ran performance benchmarks to compare with our legacy environment," says Lard. "We were able to run twice the number of transactions using half the number of servers."

This performance gain is especially noticeable when running the university's research administration application. "Switching to Cisco UCS with Intel Xeon processors resulted in a 400 to 600 percent performance improvement," says Lard. "While we expected a performance bump from the Nehalem processor technology, the real application boost came from the unified network that UCS provides. The additional bandwidth combined with the reduced latency and network hops reduced our batch runs from hours to minutes." Cisco's Oracle benchmarks also validated a dramatic improvement in Oracle application performance, despite the smaller footprint.

By shrinking the physical capacity of its data center by 96 percent, and consequently reducing power consumption by 90 percent, the UIS team saves approximately $600,000 per year. Cisco UCS also minimizes the amount of day-to-day maintenance that is typically required by the UIS server team. "What I hear from our IT staff now is 'I'm starting to get my life back,'" says Lard. "So it's really been a huge help for the entire team."

Ultimately, those who will primarily benefit from the Cisco UCS deployment are the university's approximately 57,000 student users. UIS is now in the position to increase CPU memory as needed without worrying about performance impact, ensuring a reliable and robust platform for research projects to come.

Next Steps

Enthusiastic about the cost savings of its new data center environment, the UIS team plans to expand its modernization efforts, primarily by migrating hundreds more of its Sun servers to Cisco UCS. "As we continue to remove our legacy software and hardware environments, we hope to increase our cost savings even further," says Lard. "Cisco UCS opened our eyes to what we can accomplish. This really is the technology of the future."

Product List

Data Center Solutions

- Cisco Unified Computing System (UCS)
- Cisco UCS B440, B250, B230, and the B200 Blade Servers with Intel Xeon processors

Routing and Switching

- Cisco Nexus 5000 Series Switches
- Cisco Nexus 1000V Series Switches
- Cisco Nexus 1010 Virtual Services Appliances

Applications

- Oracle Real Application Clusters (RAC)
- PeopleSoft

For More Information

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

To find out more about Cisco Nexus Switches, visit: www.cisco.com/go/nexus.

To find out more about Cisco support for Oracle technologies, visit: www.cisco.com/go/oracle.

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