University Changes the Education Model with Help from Cisco Data Center Application Delivery Solution

Cisco Application Control Engine (ACE) module provides Brandeis University improved application performance and virtualization capabilities for normal and high-traffic periods

EXECUTIVE SUMMARY

BRANDEIS UNIVERSITY

- **Industry:** Higher Education
- **Location:** Waltham, MA
- **Number of Faculty/Staff:** 1500
- **Number of Students:** 6000

BUSINESS CHALLENGE

- Provide virtual online learning environment
- Needed to separate production, test and training environments.
- Needed an application delivery solution to provide robust application availability and performance to accommodate high-traffic periods, such as student registration and ongoing online course work.

NETWORK SOLUTION

- Upgraded network foundation to consolidate infrastructure, improve application performance and leverage the benefits of ACE virtualization

BUSINESS RESULTS

- Leverage network infrastructure investment resulting in significant cost savings
- Provide attractive online learning environments which serve as recruiting tool for University
- Ease of use/ hardware management consolidated in one chassis
- High performance & availability during peak traffic periods including student registration and ongoing online course work.

Business Challenge

Located in Waltham, Massachusetts, Brandeis was founded in 1948 as a nonsectarian university under the sponsorship of the American Jewish community with a goal of embodying its highest ethical and cultural values and expressing its gratitude to the United States through the traditional Jewish commitment to education.

Brandeis has 7,500 students and faculty members that heavily depend on mission critical applications especially during seasonal peak times such as student registration, as well as ongoing for Brandeis' online student learning system.

"We realized it was time to upgrade when we realized we could investment-protect and better leverage the use our infrastructure with virtualization," says John Turner, Director of Network Systems for Brandeis University. "We wanted to maximize our infrastructure investment to deliver a virtual online learing environment using collaboration tools such as virtual classes, student chat rooms, wikis, and podcasts that augments and extends the classroom experience, and that changes the dynamics of teaching and learning at the university."

The university has two data centers and runs a variety of applications including PeopleSoft Version 9.0 Web-based applications, and an online course management application called Moodle, an open-source solution that helps educators create effective online learning communities. In addition to consolidating IT infrastructure and the need for virtualization, Turner and his team wanted to find a better way to manage database transactions that regularly number into thousands per day for online course work and can spike into hundreds of thousands per day during peak times such as student registration.

"During back-to-school season, we manage an average of 300,000 database transactions per day," says Turner. "There can be 5,000 students logging on and selecting classes at once; it's a very competitive time, and our network systems need to deliver at top capacity."

“ACE gives us a number of additional upgraded benefits, first and foremost being virtualization within the ACE. ACE virtualization provides Brandeis the flexibility to allocate resources to virtual devices in any way needed. Since Cisco ACE virtual devices have security and are isolated from each other, we have separated our production, test, and training environments using ACE virtual devices.”

—John Turner, Director of Network Systems, Brandeis University

Network Solution

Having had much success with Cisco Content Service Switches (CSS), Turner and his team added Cisco to the list of solutions they were evaluating and eventually selected two Cisco® ACE modules for the Cisco Catalyst® 6500 Series.

“Cisco ACE was definitely heading in a direction in which we were interested in going,” says Turner. “We’d had several years of successful use of the Cisco CSS’s. And as we saw how rapidly application development was growing and virtualization was absolutely exploding, we realized the importance of distributing our workload and giving developers access into those systems.”

Turner says he and his team saw Cisco ACE’s load balancing and virtualization capabilities as key advantages that made Cisco rise to the top of their list.

“Prior to the upgrade, we’d had a number of experiences with other load balancers, both software and hardware, and looked at some Windows and Linux OS offerings, but considering what Cisco ACE offered in terms of load balancing and how it fit in with our infrastructure as a core component of the network just made sense,” says Turner. “The ACE had access to the full backplane of the Catalyst 6500 and it replaced a number of the devices we had been using, adding virtualization capabilities, whereas the other devices could not be virtualized. Since upgrading to the Cisco ACE, our entire PeopleSoft and Moodle infrastructure is now virtualized.”

Brandeis is using the capabilities of Cisco ACE to manage resources and security policies for its applications. "We selected Cisco ACE for its security and virtualization capabilities, as well as XML configuration management interface and availability," says Turner. "These capabilities ease our IT management challenges, as we can better manage traffic across multiple servers and deploy applications within minutes, in normal business hours, without disruption to our user communities."

Training the IT staff and the tremendous time savings Cisco ACE provided was also a selling point for Turner.

“Our IT groups are somewhat segmented at Brandeis and while we work closely with all of them, there is obviously some separation and partitioning of resources. Needless to say, the respective groups including our applications group were initially a little reticent about the ACE,” says Turner. “Once we demonstrated the ACE in action with all the load balancing, virtualization, firewall service as well as power and cooling potential, they were ecstatic; they loved it.”

The ability to provision resources was also instrumental to the team.

"We wanted to make sure we were not affecting production in any way when we performed upgrades or brought on more Web services," says Turner. "ACE virtualization provides Brandeis the flexibility to allocate resources to virtual devices in any way needed. In addition, since Cisco ACE virtual devices have security and are isolated from each other, we have separated our production, test, and training environments using ACE virtual devices."

Business Results

"Our ACE upgrade has allowed us to maximize our network infrastructure investment, resulting in significant cost savings for the university," says Turner. "In the educational environment, we have peak traffic loads during back to school time, and low traffic loads during the summer; ACE helps us leverage the use of our equipment so we reduce the amount of fallow equipment."

"In addition, the ability to effectively extend our learning environment online enhances the educational opportunity for students, and makes Brandeis an attractive school of choice for the technology-savvy student population," says Turner.

High application availability and reliability are additional positive results from the Cisco ACE upgrade.

"Our applications group had requirements and ideas for what they wanted to do in terms of a proxy and a traditional load balancer, and we were able to accommodate the majority of their requests all within the ACE," says Turner. "Many of their requests included different application development and deployment requirements that we were able to combine together and present it to them on the ACE. The fact that ACE can operate similar to a Web server front-end and can work at the layer-7 level is really what gives the device such extreme power."

Turner says the flexibility of the Cisco ACE in terms of working with the Brandeis development team was another benefit of the upgrade.

In terms of return on investment Cisco ACE has provided Brandeis, Turner sites the reduction in power cooling from consolidating servers and better use of manpower resources for the team.

"Our greatest resource drain is power and cooling and, of course, manpower time," says Turner. "We have a relatively small, highly talented staff that we have to maximize and that is where we are seeing so much gain from the ACE. Virtualization and all the other ACE functions enable us to rapidly deploy, save space and we don't have to worry about port counts or worry about having a VLAN that we need to trunk down to a server. We just go through the ACE."

According to Turner, getting the team up to speed on Cisco ACE was much easier than anticipated.

"There aren't a lot of ACE experts and a key member on our team was able to very quickly become an in-house ACE expert through the through documentation Cisco provides and straight forward architecture," says Turner. "It's a real testament to how well ACE has been engineered that our team members can get the product up and running for use in an enterprise manner so quickly and successfully."

PRODUCT LIST

Cisco Application Networking Services:

- Cisco® ACE module for the Cisco Catalyst® 6500 Series
- Cisco Catalyst 6500 Series Supervisor Engine 720

For More Information

Find out more about Cisco ACE module for the Cisco Catalyst 6500 Series, please visit http://www.cisco.com/go/ace.

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