"The BIG-IP devices … have been very reliable and have freed my time to focus on other systems, and to drive our strategic initiatives—such as virtualization—forward."

James Duncan, Senior Systems Administrator, Sheridan Institute of Technology and Advanced Learning

College Enhances Learning Environment and Safety with a Flexible F5 Solution

The **Sheridan Institute of Technology and Advanced Learning** provides education in the visual and performing arts, business, community services, and technical fields. A leader in integrating mobile computing in education, Sheridan's sophisticated infrastructure includes a learning management system and many enterprise and course-specific applications.

To best support this environment (which also includes an innovative emergency notification system), the college implemented F5® BIG-IP® Application Delivery Networking devices. With the solution, Sheridan has improved performance and safety for students and staff, simplified administration, and ensured that its infrastructure can keep pace with its steady growth.

Business Challenges

Founded in 1967, the Sheridan Institute of Technology and Advanced Learning, with campuses in Oakville and Brampton, Ontario, serves nearly 15,000 full-time students and 34,000 continuing education students. The college has one of the largest and most advanced mobile computing programs in Canada, with approximately 5,000 full-time students relying on portable computers to enhance their learning experience.

Students in the mobile computing programs connect their laptops to the college's network through wired and wireless access points. They gain access to collaborative work groups, web-based research, chat rooms, lecture notes, course schedules and outlines, tests, assignments, and grades. In a typical mobile classroom scenario, students log on to the college's learning management system (LMS), download the day's coursework, and follow the instructor's lecture with accompanying online materials. After the lecture, students complete their lab work and submit it through the LMS. Often, students engage in hands-on work during the class using third-party

Overview

Industry

Higher Education

Challenges

- Provide better support for mobile computing
- Increase availability for applications
- Improve the user experience
- Ease administration for IT department

Solution

- BIG-IP Local Traffic Manager 6400
- BIG-IP Local Traffic Manager 8900

Benefits

- Achieves better business intelligence and results
- Improves performance and stability
- Provides high scalability and efficiency
- Reduces data center costs
- Easy to use

applications specific to the topics they are studying.

As Sheridan's mobile computing program and the general student population grew, so did the number of users accessing centralized applications. Online tools are used heavily, as are other enterprise systems—including the LMS, the college's student administration system (based on Oracle PeopleSoft Enterprise Application), human resources and financial management systems, its Sun Java-based e-mail environment, and the Lightweight Directory Access Protocol (LDAP) that provides authentication for the entire college.

"We had a load balancing system in place for these applications, but it wasn't very flexible," says James Duncan, System Administrator at Sheridan. When the IT department performed scheduled maintenance on any of its enterprise systems, issues arose. He says, "We didn't have much flexibility to direct traffic away from servers that were temporarily unavailable. If a server was down, users received a page-not-found message." The downtime caused strain on the IT department. "We had much higher help desk call volumes because of these outages," explains Duncan.

The IT department also received many requests to implement specific departmental applications. "The previous load balancing environment was quite volatile. Our position was, 'If it isn't broken, don't fix it.' This made it difficult to meet the needs of the college. We were hesitant to implement new applications that would have to rely on the load balancers because we didn't want to sacrifice the stability of the other applications that were running through them."

In 2006, Sheridan began to phase out its old LMS and replace it with a newer system. "We experienced a number of challenges with our former load balancing solution when we went to implement a new LMS. We couldn't get the SSL proxy working, and the load balancers weren't certified or supported by Blackboard, our LMS vendor," says Duncan.

> "We had many different problems with the previous system. The stability that BIG-IP LTM provides has been a boon."

Sheridan was also on the forefront in terms of implementing virtualization technology in its data centers. In 2006 the college had also subscribed to a virtualized data center model, using technology from VMware. "We needed to implement flexible load balancing and application traffic management to our virtual machines to really make the environment as efficient and as effective as it could be," says Duncan.

Finally, to improve the safety of students, faculty, and staff, Sheridan was on a quest to implement an effective, centrally managed security and safety notification system. "In the beginning, we were working in silos," explains Duncan. "The IT department had created a mass e-mail notification system, and we had a global system for distributing emergency notifications to voice mail, and also a process for implementing a 'dark site' [a web page that can be customized with an emergency message, to which the college can redirect web traffic in the event of an emergency], but the systems did not interoperate."

Also, the dark site system in particular was highly manual. Security personnel were unable to manage the site themselves. In the event of an emergency, an IT staff member had to be present to manually switch web traffic to the servers designated for serving the emergency notification page. He continues, "We couldn't ensure that in the event of a campus-wide lockdown that an IT staff person would be at his or her desk to do the manual switchover."

Solution

Sheridan leases its hardware on a three-year refresh cycle. So, as the load balancing solution came up for lease renewal, the IT department evaluated solutions from other vendors, including F5. "Blackboard supplied us with a list of preferred vendors," recalls Duncan. "After a basic evaluation of features and functionality, we decided that F5 was the clear winner."

The IT department was particularly impressed with the flexible traffic management that BIG-IP Application Delivery Networking products and F5 iRules® technology—a customizable scripting language that gives IT departments complete and granular control over application traffic—provide. Duncan adds, "And even though we are used to a command-line interface, we liked the user-friendly web interface of the BIG-IP system, the easy-to-read statistics, and the management capabilities."

In 2006, Sheridan implemented two BIG-IP® Local Traffic Manager™ (LTM) 6400 devices at its primary data center in Oakville. "We chose the BIG-IP 6400 devices as opposed to a lower model because we wanted a lot of room for growth," says Duncan. "For instance, the number of users for our LMS system has quadrupled in the past four years. We knew that the 6400 devices would provide us with ample headroom."

For the past three years, Sheridan has relied on the BIG-IP LTM devices to manage traffic to all of its enterprise systems and to course-specific applications. "The BIG-IP devices sit in front of all of our critical systems," explains Duncan. Systems include the college's corporate web servers, the LMS, LDAP, its Microsoft Office SharePoint Server environment, PeopleSoft, its Sun ONE e-mail environment, and numerous, smaller-scale departmental applications.

Many of these applications are running on virtual machines (VMs) enabled by VMware vSphere 4. The college uses three Dell R900 servers as well as a number of blade server computers to support its

virtualized environment. "We have about 140 VMs, which represents over one-third of all of the servers in the college," says Duncan. "A number of the applications running on VMware are front-ended by the BIG-IP devices."

The BIG-IP LTM devices also support the Sheridan Incident Response and Emergency Notification (SIREN) system, an automated security and safety notification system that provides an interface for authorized staff to initiate a number of changes to the college's IT systems in response to an incident. Using iRules technology, the IT department created a system by which, in the event of an emergency, a security staff person can open a web-based SIREN administration page in SharePoint Server 2007 (which serves as the system's unifying platform and the interface through which personnel can create customized emergency messages) that can automatically invoke an iRule that redirects URL requests for multiple load-balanced services to a dark site event page.

Its use of iRules also enables Sheridan to automatically redirect traffic during unplanned or planned server maintenance. "We perform scheduled maintenance on our new LMS every third Sunday of each month," explains Duncan. "We take the system down completely, and by toggling a setting in the iRule configuration, we can redirect users to a page that tells them when to expect the system to be back online. It's much more user friendly."

The college also uses iRules to help manage traffic so that it can effectively analyze it for marketing and troubleshooting purposes. With load balancers in place, the analytics software that runs on Sheridan's web servers identifies the traffic as coming from the load balancer. "But, using an iRule, we can embed some client information into the request that is passed on to the back-end application servers" explains Duncan. "We can then identify the original client address. This gives us valuable demographics information."

The same iRules flexibility enables the college to isolate different types of traffic and direct it to dedicated servers. For instance, an iRule can identify whether the request is coming from a student or a staff member. This proves valuable at times when a particular system is experiencing heavy use. Sheridan's PeopleSoft system is used by faculty and staff to create course offerings and conduct payroll and human resources tasks, but it is also used by students to register for classes at the beginning of each term. During registration, use of the system spikes, and if the traffic isn't carefully managed and isolated to the appropriate servers, users may experience sluggish performance or even downtime.

Sheridan is currently upgrading its data centers to achieve 10 Gigabit Ethernet (GbE) connectivity. Since the BIG-IP LTM 6400 devices were close to their lease renewal time, Sheridan recently upgraded to BIG-IP LTM 8900 devices, running BIG-IP version 10 software. "The 6400 devices would have been more than ample in meeting our needs for at least three more years," says Duncan. "But since the upgrade, we've really enjoyed the partitioning of objects and users. We've been able to give other IT business units a limited amount of access to the BIG-IP devices, which will give them increased visibility and control over how their applications behave over the long term." Sheridan also plans to soon use the BIG-IP LTM 8900 devices to manage traffic to the SIREN application servers, which, enabled by Office SharePoint Server 2007, run in a virtualized environment.

Benefits

Since implementing the F5 solution to support its infrastructure, Sheridan is able to provide a better user experience and to realize better business results in a more efficient, cost-effective manner.

Achieves Better Business Results

With the F5 devices, Sheridan can more easily meet changing business requirements. "We often have to accommodate departmental needs on the fly and meet challenges that we couldn't have anticipated," says Duncan. "BIG-IP LTM gives us the confidence to move the business of the institution forward without worrying whether we'll be overtaxing our load balancing system. With BIG-IP LTM devices, we no longer worry that adding a new application will affect the stability of the other applications in the system."

BIG-IP LTM and iRules also provide Sheridan with better business intelligence. "With iRules, we can identify the original clients of our web-based systems. This helps us identify our biggest demographics so that we can effectively target and support our audiences," says Duncan.

Improves Performance, Stability

This same flexibility enables the IT department to provide uninterrupted service to its users. "When student registration opens, if we had all of our users going through the same servers, the system would get flooded. With BIG-IP LTM and iRules, we can separate student traffic so that staff members won't be affected by the student load. Business processes can continue, without interruption," says Duncan.

Sheridan also reports that the system has been fully stable since its implementation, three years ago. "In three years of using BIG-IP LTM, we have only had two support cases and they were both trivial issues," says Duncan. "We had many different problems with the previous system. The stability that BIG-IP LTM provides has been a boon."

Provides High Scalability, High Efficiency

The BIG-IP solution has proven highly scalable and efficient for Sheridan, especially in its virtualized environment. "VMware gives us the ability to create VMs and add them to the virtual pool quickly," says Duncan. "And BIG-IP LTM enables us to configure the virtual server pool very easily."

Over time, as it continues to gain efficiency by adding more VMs to its environment, Sheridan will realize significant cost savings. "The two BIG-IP LTM devices have helped us achieve a great consolidation thus far, and the efficiency gains and associated cost savings will continue to add up. Our racks are getting emptier as we virtualize, and the BIG-IP devices are a huge part of this."

Easy to Use

The use of BIG-IP LTM and iRules have simplified life for the IT department and enabled staff members to focus on more than just system maintenance. "The scripting capabilities have given us so much flexibility," says Duncan. "For instance, we augmented SIREN with BIG-IP LTM out-of-the-box capabilities. It was done very quickly, and there are so many more capabilities that haven't been tapped yet."

Whether a URL request is headed for a physical or a virtual server, it can be redirected seamlessly to the SIREN system's dark site event page. "No matter what," claims Duncan.

And because security personnel can easily make the switch-over to the dark site through a centralized Office SharePoint Server site, "The IT department need not be involved in posting the message or switching the flow of traffic to a different server," he says. The system is not only less reliant on the IT department, it is also more effective because emergency communications are no longer dependent upon the presence of an IT staff member.

Duncan, as the point-person for server traffic management, is now able to perform that job as well as manage other critical systems. "The other load balancers consumed all of my time," he says. "The BIG-IP devices, on the other hand, have been very reliable and have freed my time to focus on other systems, and to drive our strategic initiatives—such as virtualization—forward."

F5 Networks, Inc.
Corporate Headquarters
info@f5.com

F5 Networks
Asia-Pacific
apacinfo@f5.com

F5 Networks Ltd.
Europe/Middle-East/Africa
emeainfo@f5.com

F5 Networks
Japan K.K.
f5j-info@f5.com

CS02-00021 0710