

A need for speed: Appliances improve delivery of Web-based apps

Application delivery controllers -- also called appliances -- are a great way to speed things up.

Sandra Gittlen

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At Subaru Canada, executives are not only focused on the performance of the vehicles they sell, but also on the performance of the company's website. The ever-increasing amount of rich media, video and other assets available to customers through Web-based applications and databases has put pressure on the IT team to find new ways to hasten information delivery.

"Customers aren't just looking for quality and breadth in the vehicle and company information we offer via the Web; they want speed. How quickly they can get at manuals, video, specs and other data is a large part of customer satisfaction," says George Hamin, director of e-business and information systems at Subaru Canada, which supports 86 licensed Subaru dealers.

Hamin says that goal becomes particularly challenging when new vehicles are introduced. That's when customers scramble to the Toronto-based company's website to use all of its multimedia information sources, including customizable vehicle views, short webcasts and price lists.

During those peak times, upwards of 306,000 visitors access the site each month, viewing almost 2 million Web pages. "You've got people requesting and downloading 10MB owner's manuals and streaming 100Mbit/sec. videos. That's a lot different than simply serving up 65KB JPEG images of the cars," Hamin says.

To ensure optimal performance at all times, Hamin first decided to move all of the videos to YouTube and stream them from there. That significantly reduced workload demands on the server, the network and the rest of the infrastructure. But it didn't solve all of his problems, because the site is laden with other rich-media



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content and has interactive tools that customers use to compare vehicles, find dealers and retrieve parts and service information.

Hamin needed an extra hand, and he got it from acceleration and offloading appliances that help deal with the remaining processing chores. To handle caching, compression and load balancing, he deployed two AX Series application delivery controllers from A10 Networks. Those hardware appliances, which sit at the head of Subaru Canada's server farm, cache all vehicle and logo images and serve them directly to customers; there's no need to hit the back-end servers. For dynamic pages, the appliances compress them after they've been rendered and then send them to the client machine, making for a faster delivery time.

Since deploying the AX Series equipment, Subaru Canada says it has seen infrastructure improvements, including a more than 50% reduction in Web page loading times and a more than 40% reduction in bandwidth usage.

Appliances help ease the strain on servers

Jim Metzler, vice president of business consultancy Ashton, Metzler and Associates, says that the ongoing "webification" and centralization of applications as well as the use of cloud-based systems is putting an intense strain on data centers. Added to this is the application-to-application and database-to-database communication that goes on in back-end environments. For instance, banks are now heavily focused on cross-selling and therefore need car loan, home equity loan and personal loan applications and databases to all work together transparently and quickly. "Any delays could result in a loss of business," he says.

This has led to an increase in the use of physical and virtual appliances to accelerate and control application delivery. Physical appliances are connected to servers, while software-based virtual appliances reside on servers. Often called application delivery controllers (ADC), these appliances can handle any or all of the following functions: server load balancing, TCP offload, SSL offload, caching and compression. Their purpose is to free up server CPU cycles by taking on some of the extraneous tasks that servers routinely perform. However, many ADCs cost as much as servers, and some are much more expensive than the typical server. ([See our product listing.](#))

Worldwide end-user spending for application acceleration equipment, which includes ADCs, grew about 11%, to \$801.3 million, from the third quarter of 2010 to the fourth quarter, according to a March 2011 Gartner report.

Metzler says that offloading server tasks to ADC appliances can eliminate the need for more servers, which could save on data center floor space, power and cooling.

Kevin Tolly, president of The Tolly Group, an IT equipment testing firm in Boca Raton, Fla., agrees but says organizations shouldn't rush to ADCs. He advises companies to think carefully about what they want to accomplish with an appliance and then look for one that matches their needs. For instance, a site that doesn't do transactions wouldn't need SSL offload capability. But a site that handles lots of simultaneous connections would want to consider a product with TCP offload functionality.

Helping with 'bursty' traffic

At TicketFly, a San Francisco-based event ticket service, finding an appliance that could handle high transaction volumes and big spikes in traffic was mission-critical.



TicketFly's Sean Porter says an ADC helps smooth out the ticket broker's 'bursty' traffic.

"We have incredibly bursty traffic," says Sean Porter, senior vice president of technology at TicketFly, which sells tickets for events such as concerts by indie bands at venues around the country that don't usually handle their own ticket sales. "Tickets go on sale at 10 a.m. and they could sell out in 10 seconds. Sometimes we have 70,000 people trying to get 2,000 tickets. A slowdown of any kind could have a horrible impact on our business." Porter likens a slowdown caused by a traffic spike to a denial-of-service attack on his own network.

Like Hamin, Porter looked at his environment in layers before picking a product. He first offloaded graphics such as images of album covers and the like to a third-party content delivery network rather than storing them in-house; that freed up server and storage resources. Then he focused on speeding the site's most crucial function -- database queries. He deployed Terracotta's Enterprise Suite performance optimization software. The Terracotta virtual appliance caches redundant queries in RAM rather than digging into the disk each time. "This makes sure that everyone who comes to TicketFly isn't waiting to access the database and receives faster service," Porter says.

Hardware vs. software: Which speed-up approach is best?

In the early days of application delivery controllers (ADC), the offerings were primarily hardware-based, and that often meant that users had to buy systems that were highly engineered from the ground up specifically to support application delivery control. "Back then, hardware-based ADCs included special high-performance ASICs that could do things like deep-packet inspection very quickly and with low latency," says Kevin Tolly, president of The Tolly Group testing firm.

However, enterprise users found that while these machines helped optimize performance, they also cost a lot of money and took a long time to deploy. Moreover, tasks such as upgrading, maintaining and patching hardware ADCs presented management challenges and required a good deal of downtime.

Today, vendors of hardware-based ADCs are taking advantage of improvements in general-purpose server technology, such as multicore processing, to lower prices without sacrificing performance. Tolly says offerings from appliance makers such as A10, Brocade, Coyote Point and Radware all have shifted the processing to their software, which allows them to use off-the-shelf motherboards.

Other companies, such as Zeus and Terracotta, offer purely software-based products that have the obvious advantage of no dedicated hardware costs. Software appliances can run on many kinds of commercial servers, and they can share hardware with other applications, sources say.

[\(For more vendor names, see our product listing.\)](#)

With both types of ADC, customers can roll out new features, updates and upgrades without having to bring the systems down or replace hardware. But some industry experts contend that since software-only ADCs might have to share system

As TicketFly and its customer base grow, Porter adds, the Terracotta system will enable him to add ADC resources without requiring code-level changes to the ticket broker's applications.

Other ADC appliance makers, including Schooner Information Technology, are also tapping RAM, dynamic RAM and flash memory to take the database query load off the hard disk and improve response times.

While transactions are Porter's biggest bugaboo at TicketFly, Beth Israel Deaconess Medical Center's CIO, John Halamka, is wrestling with information sharing among physicians. Two years ago, as part of a larger \$10 million project, the Boston hospital created a portal so it can act as an ISP for its 1,700 affiliated doctors.

BIDMC offers its physicians access to community warehouses that measure care quality, plus other applications such as practice management, clinical documentation, e-prescribing, laboratory and radiology systems. Most important, Beth Israel Deaconess has built the portal so that applications can share data -- with a patient's consent.

The obstacle, lies in the connection to some doctors' offices, says [Halamka, who is a Computerworld columnist.](#)

resources with other applications, purpose-built appliances are far better suited to the demands of application delivery control. Hardware-based ADCs also tend to have built-in SSL offload and protection against distributed denial-of-service attacks for mission-critical deployments.

This argument could become moot going forward as more companies engage in cloud computing. In that case, they would most likely be using virtual appliances, which are essentially software, to have ADC functionality in the cloud. Many hardware-based ADC vendors are introducing virtual versions of their tools to make management and scaling easier.



John Halamka says his group's hardware ADCs handle caching, compression, load-balancing and SSL offload at Beth Israel Deaconess Medical Center.

"There is a lot of old copper out there, and the average doctor in eastern Massachusetts is struggling to get away from DSL," he says.

That means it was up to Halamka and the IT team to speed portal, application, database and data access regardless of the end user's connection speed. To do that, he deployed Array Networks' TMX and SPX hardware-based ADC appliances to handle caching,

compression, load-balancing and SSL offload. The appliances sit between the firewall and the hospital's Apache Tomcat-based Web server blade with VMware, which is connected to MySQL databases. Each time a new physician comes online, Halamka and his team spin up a new virtual server.

The appliances handle SSL offload to ensure secure remote access capability for the physicians, and they deal with all encrypting and decrypting of traffic sent via SSL. The Array systems also compress data whenever possible to optimize delivery over the slower connections. And finally, they cache large pull-down data sets so the server doesn't get taxed.

Halamka says offloading these responsibilities preserves his server farm investment and avoids the need for more infrastructure. Although his ADC doesn't speed the actual layer between the application and the database, it does boost the performance of every other aspect of delivery so the client experience is greatly enhanced, he says.

Getting redundant

Halamka and Subaru Canada's Hamin are proponents of using multiple ADCs to ensure redundancy and availability. Halamka uses his Array appliances in a cluster where both appliances are in use but there's extra space in case either is required for failover. This avoids a single point of failure as the appliances sit in front of the Web server. "You want to offload demand on your Web servers wherever possible, but not at the expense of security, reliability and availability," Halamka says.

Hamin has one of his A10 units in front of his Web server farm and another in front of his Microsoft Exchange Server. He says he's excited about new virtual appliance capabilities he hopes to test-drive this year, because they could allow him to carve out functionality for each server on the same box and use the other box for an added layer of redundancy.

Vendors such as Cisco, Citrix and F5 Networks offer virtualized versions of their appliances so customers with hybrid environments can manage their on-site and cloud-based application delivery as one. In fact, Tolly recommends that companies just venturing into cloud computing should ask their providers which ADC they use to see if there's an opportunity to match them up to their internal ADCs. Using the same ADC both in the cloud and on-site would simplify overall ADC management and enable IT teams to easily extend policies and configurations into the cloud.

Overbuying is very common in the ADC world.

Kevin Tolly, President, The Tolly Group

needs.

Overbuying is very common in the ADC world, says Tolly, noting that many companies end up with appliances that have enormous "headroom" for growth. He warns organizations not to end up paying a premium for performance and features they don't need.

Companies should carefully consider their traffic patterns and aim for an appliance and feature set in that bracket. For instance, a county elections board wouldn't need a large-scale enterprise ADC from F5; a midsize Barracuda Networks Load Balancer might meet its needs.

After an appliance is deployed, consultant Metzler says it's important to assess the impact it will have on the network by activating features such as SSL offload, compression and caching one at a time.

Hamin says he studied the features of his A10 appliances carefully, especially the Gzip compression functionality, which condenses pages so they can be transmitted more quickly. Although not every browser supports the Gzip algorithm used in the A10, Hamin found that when browser support exists, big performance gains were made and it was worth the effort.

Overall, Subaru Canada has found ADCs to be worth the investment, and it hopes that the appliances will enable its website to deliver a level of performance that meets customers' expectations. "You could have all the greatest server hardware and loads of bandwidth and that still wouldn't address the application delivery performance problem," Hamin says. "The use of the appliances has allowed us to grow tremendously, avoid adding servers and provide snappy service to our customers."

Virtual appliances also can be useful for balancing utilization loads. If a virtual ADC's rate gets too high, another one can be quickly spun up to share the load. That allows organizations to grow their ADC environments in line with their

Some of the players

The application delivery controller market is consolidating. NetScaler has been part of Citrix since June 2005, and Radware bought Nortel's Alteon assets in February 2009.

Here are some of the major ADC providers. Please note that exact pricing varies depending on the functionality and performance required by the customer.

Vendor name	Product name	Hardware/software based	Pricing
A10 Networks	AX Series	Options for both	Starts at \$16,000
Array Networks	APV Series	Hardware	Starts around \$10,000
Barracuda	Barracuda Load Balancer	Hardware	Starts around \$2,000
Blue Coat Systems	ProxySG	Both	Starts around \$5,000

Vendor name	Product name	Hardware/software based	Pricing
Brocade Networks	ServerIron ADX Series	Hardware	Starts around \$12,995
Cisco	Application Control Engine	Both	Starts around \$39,995
Citrix	NetScaler	Both	NetScaler VPX pricing starts at \$2,000; MPX starts at \$12,000
Coyote Point	Equalizer and Equalizer On-Demand	Both	Available in a \$15,000 version and a \$2,000 version
F5 Networks	Big-IP	Both	Starts around \$15,000
Radware	Alteon Application Switch and Virtual Director	Both	Starts around \$15,000
Terracotta	Terracotta Enterprise Suite	Software	Starts from \$5,000 per application server node
Zeus	Zeus Traffic Manager	Software	Starts around \$17,500

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