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WHITE PAPER

Advanced ADCs Take Over Where Server Load Balancers Leave Off

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In the last decade, server load balancers (SLBs) were hailed as the solution to website scalability and availability problems. These devices balanced traffic across servers to ensure the site was available and could handle traffic spikes. If one server went down, the load balancer redirected traffic. When a site got "slashdotted" you could add more servers transparently.

Flash forward to 2010; Web servers aren't just delivering static content, they're delivering apps. Businesses are using web based applications to deliver mission critical functionality to employees and customers. Simple load balancing is no longer sufficient.

Fortunately, load balancers have evolved into Application Delivery Controllers (ADCs). This new species understands application specific traffic and can optimize application server performance by offloading many of the compute-intensive tasks that would otherwise bog down CPUs that could be better occupied elsewhere. A common comparative analogy used to describe the role of SLBs is to compare them to a "network traffic cop". We'll use this analogy to describe how ADCs take over where load balancers leave off.

It's the destination that matters

When a car is disabled on an interstate highway, a traffic cop will direct cars around the disabled lane. Similarly, an SLB can direct network traffic away from a slow or disabled server. But, the highway, much like the data center, is only a means to the end. What's really important to you is the destination (or, the "application", in data center terms). And every destination is unique, each with its own priority and value to the data center operators and the users accessing applications.

For example, you may take a different route to get to your office than you do to your grocery store. And getting to the office in a timely manner probably has a higher priority. When you get into your car, you want to get to your destination as expediently as possible. What we need today is a traffic cop who cannot only clean up the mess after it happens, but can actually prevent the traffic jam from occurring in the first place. That's the role of the ADC.

In addition to load balancing traffic, what distinguishes advanced ADCs from server load balancers is their ability to intelligently route users to their application and content destinations efficiently and intelligently, based on business priorities and goals.

Referring to the analogy above, imagine the ADC is the ultimate traffic cop; one who would not only redirect you around the disabled lane, but would ask you where you were going, and would take into consideration the time of day, and where the location is within the surrounding city. With that information, he would give you directions and would take you directly to your destination, bypassing

stoplights, construction and delays along the way.

Applying this analogy to users requesting applications and content from a data center, an advanced ADC will route users to destination servers based on a variety of criteria that the data center manager implements using policies and advanced application-layer knowledge to support business requirements. And, much like our example officer, an advanced ADC will ensure that the users get to the applications based on their specific needs while protecting the network and applications from security threats.

Web servers aren't just delivering static content; they are delivering mission-critical applications that businesses rely upon to support their employees and customers. ADCs understand application-specific traffic. They can optimize application server performance by offloading many compute-intensive tasks that would otherwise bottleneck the server CPUs needed to deliver applications to users.

Among the advanced acceleration functions present in modern ADCs are SSL offload technology, accelerated data compression, TCP and HTTP protocol optimization and virtualization awareness.

Much in the same way that a highway commuter lane has fewer cars with higher occupancy to reduce congestion advanced ADCs offload servers by reducing the bandwidth utilization required to deliver application data from the datacenter to the desktop. ADCs offer compression to remove non-essential data from traversing network links. This help to deliver maximum bandwidth utilization to support more traffic and avoids the need for network upgrades.

By offloading and accelerating SSL encryption, decryption and certificate management from servers, ADCs enable web and application servers to use their CPU and memory resources exclusively to deliver application content and thus respond more quickly to user requests. Our smarter traffic cop comes to the rescue again, this time eliminating distractions that prevent you from concentrating on the driving tasks at hand.

Web based applications consist of a variety of different data objects which can be delivered by different types of servers. ADCs provide application-based routing using file types to direct users to the server (or group of servers) that is set up to handle their specific information requests, such as ASP or PHP applications. User requests can be routed to different servers by sending requests for static file types (jpg, html, etc) to one server group, and sending user requests for dynamic data to other servers optimized for the purpose. Like the ultimate traffic cop, the ADC knows the optimal path for each destination.

Finally, imagine that on your way home from work, you stopped at your favorite take-out restaurant and placed an order for dinner. If you took advantage of the time required to prepare your meal by running a few errands you'd optimize your commute and return to the restaurant to pick up your order. At the risk of stretching our analogy to the breaking point, what would happen if you returned to the restaurant across the street by mistake? Almost certainly they would not have your order. Not surprisingly there is a similar situation that improper load balancing can inflict on application servers. The "shopping cart" problem occurs when you establish session state with one server (add an item to a shopping cart) and are then load balanced to a different server to check-out. In many e-commerce applications, you'll find your cart empty.

Advanced ADCs use session state with HTTP headers and cookies to ensure that users and servers remain "persistent". The ADC uses the cookie within the HTTP header to ensure that users continue to be directed to the specific server where the session state information resides. Without this capability, if the user went to a different server, the previous transaction history would be lost, and the user would need to start the transaction over. Once again, the ultimate traffic cop saves the day (and your dinner) by understanding the application, network conditions and your priorities.

Coyote Point's Equalizer – Application Delivery Controller

Coyote Point has been an application delivery innovator for over 10 years. In 1999 we introduced our first server load balancer and we've shipped thousands of units since then. Today, Coyote Point leads the industry in producing reliable, high performance Application Delivery Controllers that can be scaled to meet any application delivery environment. Coyote Point's Equalizer ADC products are deployed by small, medium and large enterprises, including some of the busiest sites on the web.

At Coyote Point, we pride ourselves on delivering value to our customers. Our products perform as advertised and are easy and enjoyable to use and deploy. With a versatile and powerful architecture, CPS provides the highest value while enabling customers to optimize businesses that rely on Internet-based infrastructure.

Summary

When evaluating an application delivery solution, keep in mind that not all ADCs are capable of advanced acceleration, virtualization management and policy-driven application routing. If you're considering purchasing one of these powerful devices, you may find that the flexibility that policy-driven application-layer features provide will give you greater control to improve how your data center supports your business objectives.

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