Application Delivery Controllers

As enterprises move key applications to private and hybrid clouds, application delivery controllers (ADCs) with their optimization, load balancing and security are more crucial than ever.

BY DR. JIM METZLER

- EVALUATING AN APPLICATION DELIVERY CONTROLLER
- THE ADVANTAGES OF A VIRTUAL APPLICATION DELIVERY CONTROLLER
- NEXT-GENERATION APPLICATION DELIVERY CONTROLLERS

Evaluating an application delivery controller

IT ORGANIZATIONS ARE under pressure to deliver better performing services at a lower cost. As a result, an ongoing series of small incremental IT improvements will not be sufficient to enable IT services to be viewed as being cost-effective and agile. What is needed is a fundamentally new approach to how IT services are provided—one that provides more than incremental improvements.

One such approach that has been adopted by the majority of IT organizations is server virtualization. One of the primary benefits of server virtualization is that it allows IT organizations to consolidate servers. This typically results in a significant reduction in cost. Another one of the primary benefits of server virtualization is agility. For example, once a server has been virtualized, it is possible to dynamically provision virtual machines (VMs) and to dynamically move VMs among physical servers, both within a given data center and between disparate data centers without service interruption. Unfortunately, while it is possible to move a VM between physical servers in a matter of seconds or minutes, it can take days to move or reconfigure the supporting infrastructure. IT organizations will not realize the full value of server virtualization until all of the components of the infrastructure that support a VM can be moved or reconfigured to support the VM once it is moved. That the process takes no more than a few minutes.

One of the primary benefits of server virtualization is that it allows IT organizations to consolidate servers.

A major component of the infrastructure that supports a VM is an application delivery controller (ADC). Many IT organizations have deployed ADCs in an effort to improve application performance. An ADC improves application performance by sitting in front of a server farm and delivering service requests

to the members of the server farm based on criteria such as the load that each server is currently processing. Another way that an ADC improves application performance is by performing computationally intensive tasks—such as SSL or TCP processing—by freeing up server resources. An ADC can also accelerate the performance of applications delivered over the wide area network (WAN) by implementing optimization techniques such as compression and reverse caching. The basic role of compression is to reduce the amount of traffic transmitted over the WAN. With reverse caching, new user requests for static or dynamic Web objects can often be delivered from a cache in the ADC rather than having to be regenerated by the servers.

In addition to that basic set of functions, some ADCs perform advanced functionality such as scripting, which allows the IT organization to directly classify and modify the traffic of any IP-based application. Other advanced functionalities that some ADCs provide include application response time monitoring and security functionality such as application layer firewalls.

SELECTING AN APPLICATION DELIVERY CONTROLLER

When selecting an ADC, IT organizations need to evaluate how well it provides the functionality described above and how well it performs in the environment in which it will be deployed. In addition, IT organizations often have to balance goals that are in conflict. For example, IT organizations must ensure that the ADC can provide all of the functionality that is currently needed at the lowest possible cost. IT organizations also need to ensure that the ADC will provide the performance that is currently needed even when a feature such as security is enabled. However, IT organizations have to also take into account anticipated future demands in order to ensure that the ADCs that they acquire today don't quickly become obsolete, either because they don't offer the functionality that the organization will need in the future or they can't provide the additional performance that will be required. ■

The advantages of a virtual application delivery controller

THE PHRASE *virtual ADC* has a number of meanings. One meaning of virtual ADC is that a number of smaller ADCs are made to perform like a single, large ADC. This is important because when an IT organization acquires an ADC, it typically doesn't want to pay for more performance than it needs. However, IT also doesn't want the ADCs to become obsolete because it can't provide the performance needed a year or two after it is purchased. By using this form of a virtualized ADC, an IT organization can add new ADC performance when required by adding additional ADCs. This approach allows an IT organization to minimize the cost of providing ADC functionality by allowing IT to leverage the investment that it has already made in ADCs.

The relative cost of a virtual ADC versus an ADC is one of the criteria that IT organizations should use when evaluating vADCs.

A virtual ADC also refers to running ADC software in a virtual machine instead of running it in a hardware-based appliance. That is the representation of virtual ADC that will be used in the remainder of this TechGuide.

ADVANTAGES OF USING VIRTUAL APPLICATION DELIVERY CONTROLLERS

One of the potential advantages of a virtual ADC (vADC) is cost savings, as many vendors claim that a vADC costs less than a traditional ADC. In fact, some vendors claim that a vADC costs roughly 30% less than a hardware-based ADC. Whether or not there is a pricing difference, and if so, how much, will vary by vendor. As such, the relative cost of a vADC versus an ADC is one of the criteria that IT organizations should use when evaluating vADCs.

Another advantage of a vADC is that it helps to make the IT organization more agile. For example, it is possible to move a vADC between physical servers in roughly the same amount of time that it takes to move a virtual machine (VM). It is also possible to deploy a vADC in less time than it takes to deploy a traditional ADC and in places where it would be difficult to install a traditional ADC—such as in a cloud computing service provider's data center.

When evaluating a vADC you must test the solution in your production environment and measure its performance.

In most cases, just because an IT organization is considering deploying a vADC does not change the requirements that must be supported. As a result, IT organizations that are evaluating vADCs need to determine if the vADC provides the required ADC functionality as described in the first chapter. IT organizations also need to know what hypervisors the vADC supports. Perhaps the biggest question that surrounds the use of a vADC is that of performance. There are lots of third-party tests that vendors are using to show whether or not a vADC performs as well as a traditional ADC. The bottom line is that as part of evaluating a vADC, IT organizations need to test the solution in their production environment and measure its performance. ■

Next-generation application delivery controllers

DEPENDING ON WHERE it is placed in the data center, the ADC serves as the gateway to the organization's applications. As such, the ADC is strategically placed to be a single control point that can determine the security needs of the applications and provide simplified Authentication, Authorization and Accounting (AAA) and application control and monitoring.

One of the more recent challenges facing IT organizations is the need to support a workforce that is increasingly mobile and uses multiple devices for communications. Because an ADC intrinsically understands the difference between applications as well as traffic from Layer 2 to Layer 7, it is in the position to provide security functionality that can change dynamically based on the user, device, network, application and even the traffic itself.

A recent challenge facing IT is the need to support a workforce that is increasingly mobile.

For example, the intelligence provided by an ADC allows an IT organization to apply a security policy to a user accessing an application from a mobile phone that is different from the security policy that is applied to the same user accessing an application from a laptop. An IT organization could also apply a policy to a particular user accessing an application from a mobile device that is different from the security policy applied to another user who is accessing the same application from the same type of mobile device.

CLOUD COMPUTING BALANCING

Another new challenge facing IT organizations is cloud computing in general, and cloud balancing in particular. Cloud balancing refers to routing service re-

quests across multiple data centers as a way to save money, improve performance, increase availability or conform to regulatory requirements. Typically one or more of the data centers are under the control of the enterprise IT organization, and one or more of the data centers are controlled by one or more cloud computing providers.

Cloud balancing can be thought of as the logical extension of global server load balancing (GSLB). The goal of a GSLB solution is to support high availability and maximum performance. A cloud balancing solution may make routing decisions in part based on the same criteria as used by a GSLB solution. However, a cloud balancing solution extends the focus of a GSLB to a solution with more of a business focus. A cloud balancing solution may also make routing decisions based on criteria such as the cost to execute a transaction in a given cloud.

Cloud balancing is a logical extension of global server load balancing.

Cloud balancing is more likely to work seamlessly if there is a consistent architecture across all of the cloud data centers. One way to maintain a consistent

Benefits of application delivery controllers

- **Being the gateway to all applications, the ADC is strategically placed to determine the security needs of the applications at a single point, providing simplified AAA, application control and monitoring that is based on per-application instance, not generalized for all services.**
- **ADCs intrinsically understand the difference between applications, which not only allows individual policy per application, but allows the ADC to understand the difference between valid user requests/activity and the increasingly potent DDoS attacks. ■**

architecture across private and public clouds is to use a virtual ADC (vADC) as described in the last chapter. These virtual appliances can be installed in virtual machines in the various clouds that comprise the global hybrid cloud infrastructure. This allows the enterprise to standardize on a single architecture across the entire cloud balancing environment as long as the virtual appliances support the hypervisors employed by the relevant Infrastructure as a Service (IaaS) providers. One of the advantages of this architectural consistency is that it ensures that each cloud site will be able to provide the information needed to make global cloud balancing routing decisions.

EVALUATING AN APPLICATION DELIVERY CONTROLLER

THE ADVANTAGES OF A VIRTUAL APPLICATION DELIVERY CONTROLLER

NEXT-GENERATION APPLICATION DELIVERY CONTROLLERS

The importance of ADCs will continue to grow in part because they make it easier to implement granular security policies.

Over the last several years, ADCs have played a major role in securing, monitoring and optimizing the performance of Web-based applications. The importance of ADCs will continue to grow in part because ADCs make it easier for IT organizations to implement granular security policies relative to which users, using which devices, can access which applications. The recent introduction of vADCs will grow the deployment of ADCs in part because they will make it easier and potentially more cost-effective to deploy ADC functionality. Virtual ADCs will also be popular because they can be easily deployed in a public cloud computing environment where it might be either difficult or impossible to deploy an appliance-based ADC. Once deployed in that environment, the vADC can provide monitoring functionality that otherwise may not have been available. ■

ABOUT THE AUTHOR

Dr. Jim Metzler *is widely recognized as an authority on both network technology and its business applications. In over 28 years of professional experience, Jim has assisted tens of vendors to refine their product strategies and simultaneously helped over a hundred enterprises evolve their network infrastructure.*

Jim holds a Ph.D. in Numerical Analysis from Boston University. Along with Lynn DeNoia, he has published a book entitled "Layer 3 Switching: A Guide for IT Professionals." Dr. Metzler is both a faculty member and an advisor to Northeastern University's State of the Art Program in Networking.

SearchNetworking.com

Rivka Little
Senior Site Editor
rlittle@techtarget.com

Shamus McGillicuddy
News Director
smcgillicuddy@techtarget.com

Kara Gattine
Senior Managing Editor
kgattine@techtarget.com

Linda Koury
Director of Online Design
lkoury@techtarget.com

Kate Gerwig
Editorial Director
kgerwig@techtarget.com

Tom Click
Senior Director of Sales
tclick@techtarget.com
617-431-9491

TechTarget Inc.
275 Grove Street
Newton, MA 02466
www.techtarget.com