



Weathering the perfect storm facing application delivery

Together, ANPO and NetScaler resolve issues that can sink
enterprise resources

Introduction

On-demand access to enterprise resources is essential to the operation of a modern business and critical to competitive advantage. It is the primary charge of IT. However, several recent trends have converged to create a perfect storm for IT administrators tasked with delivering web applications.

- **IT organizations are consolidating datacenters** to reduce costs and simplify management. Centralization moves applications further away from users, increasing the distance application traffic must travel before it reaches its destination. It also generates bigger server and bandwidth loads.
- **IT has become increasingly complex** in construction and difficult to manage. For most companies, application infrastructure is a many-layered environment. Each layer—client-server, web or desktop applications—poses specific application delivery challenges. Each new technology adds complexity, resulting in inefficiencies that directly affect your organization’s ability to grow, and your bottom line.
- **Application users are increasingly mobile**, moving further away from the datacenter and accessing applications via a wider variety of devices and network connections. These factors increase latency, and cause greater packet loss and overall stability problems. The need to support not only remote users but an increasingly wide range of access scenarios (mobile users, partners, outsourcers) strains infrastructure and increases server and network loads.
- **Applications delivered over the web use extremely chatty protocols** such as HTTP which generate a lot of back-and-forth hand-shaking traffic between the server and the client device. Web applications generate thousands of connections per second. The net effect is more traffic on the network. WAN and dial-up connections often flounder, delivering low bandwidth and high latency—with two unfortunate, costly consequences: low throughput and long wait times for frustrated users.
- **The need for tighter security continues to grow.** The majority of attacks today are at the application layer and are designed to steal valuable corporate or customer information. Mission-critical web applications require stringent security policies to ensure that confidential data is never compromised. In addition to protecting application data in transit, your application infrastructure should be hardened against attack. Incomplete security leaves holes through which private data can be intercepted or applications brought down. There are also continually increasing demands to meet and maintain compliance with the varying personal privacy and intellectual property regulations throughout the world.

The result is that organizations are challenged to provide optimal performance and availability while also controlling costs.

An effective solution

An effective solution must handle two separate requirements: application level and networking elements.

Addressing application issues requires an understanding of what the application and the user are actually trying to do. This means that the solution must be able to see application-layer information, understand the application-layer vernacular, and then take action based upon them. In short, the solution needs to be user- and application-aware.

Since web applications are delivered across networks, many of the issues involve network elements, so the solution must have the ability to tightly integrate and interact with networking elements. In short, the solution must be network-aware.

ANPO

IBM Application and Network Performance Optimization (ANPO) understands both solution requirements and enables customers to save cost and optimize web application performance. ANPO reduces bandwidth, power and server expense. It helps you determine how datacenter application acceleration technologies can improve the performance and availability of application delivery within and between your datacenters, with the ability to also evaluate these technologies in light of your business continuity and disaster recovery requirements.

ANPO uses Citrix® NetScaler®, a web application delivery appliance that accelerates performance, provides L4-7 traffic management, offers an integrated application firewall and off loads servers to ensure application availability, increased security and substantially lower costs. It reduces TCO of web application delivery, optimizes the user experience and makes applications run five times better.

ANPO and NetScaler together:

- Optimize your web applications – Providing up to 15-times faster performance
- Accelerate application servers – Enabling response-time improvements of up to 70 percent
- Reduce infrastructure complexity and operational costs
- Maximize your current investments
- Improve security and effortlessly comply with regulations



Citrix NetScaler

NetScaler, the market leader in application delivery, provides proven and secure web application delivery for millions of users worldwide. It unifies all of the capabilities of conventional load balancers, traffic managers and remote access systems with advanced, application-based functionality. It delivers the performance, security, availability and cost savings you need to deploy critical applications over IP-based networks with confidence. Seventy-five percent of all Internet users go through a NetScaler system each day.

Deployed in front of an application server, it is a purpose-built appliance that addresses both applications and their associated technologies, and the network and its associated technologies. It solves the fundamental issue of poor response times caused by complex, high-traffic web applications running over inefficient networks. It ensures high application availability and defends against application-layer attacks. NetScaler has full visibility into web transaction requests and responses. Administrators can define policies for accelerating applications and for networking and system-level information (e.g., server health, least connections, etc.). It provides application-level security based upon what is going on within a specific transaction and for a given user. It is also tightly integrated with the network.

Because NetScaler addresses both the application-level and network needs required for an effective solution, it is the best choice for resolving the perfect storm that IT faces.

ANPO – NetScaler benefits

Optimize web applications – Up to 15 times faster performance

All too often, problems with application performance are deemed a function of server hardware. Yet increasing processing power in a server may have little or no effect on application performance and scalability. The same may be said for adding load-balanced servers to cope with increased load. As the quality of user connections decreases (remote, satellite, etc.), NetScaler ensures that performance remains consistently fast. From wherever they are, users get what they need, when they need it—to get more done in far less time.

NetScaler leverages multiple acceleration technologies and innovative TCP optimizations to reduce response times for all users, regardless of their location.

- **Advanced TCP Optimization** technologies such as client keep-alive, fast ramp, windows scaling and selective acknowledgement improve the performance of the underlying network infrastructure so that applications are delivered to clients more quickly.
- **TCP Multiplexing** efficiently consolidates large numbers of incoming client requests into a much smaller number of persistent back-end connections, offloading expensive TCP setup and tear-down operations from your servers.

- **TCP Buffering** intelligently buffers application server responses and delivers them to the client at the client's speed, freeing the server to perform other tasks.
- **Citrix® AppCache™** delivers in-memory content caching for both static and dynamically generated application data, reducing the time needed to run reports and serve frequently accessed content.
- **Citrix® AppCompress™** compresses data traveling over HTTP or any TCP-based protocol, reducing bandwidth requirements and speeding the delivery of content to users.
- **SSL Offload** provides high-performance, hardware-based acceleration, freeing up back-end servers from computationally intensive encryption processing.

Application availability

A key aspect of user productivity and satisfaction is high availability of applications. NetScaler offers an extremely high-performance traffic management system to ensure maximum application availability, even under the worst conditions. This system begins with powerful web server load balancing capabilities. Load balancing provides content distribution among multiple application servers, ensuring increased application performance. Request switching ensures even traffic distribution irrespective of individual user demands.

For applications hosted in multiple, disparate datacenters, Global Server Load Balancing (GSLB) maintains a global view of the hosting infrastructure's state, and transparently directs traffic to the site best able to fulfill the client's request based upon site availability, proximity and capacity.

For more sophisticated traffic policy management requirements, Layer 7 content-switching capabilities guarantee that the right application data is served from the right application server to the right application client every time. Content-switching policies can be defined based upon any information within the TCP Header or payload. This, of course, includes HTTP.

Rewrite functionality can be used to insert, delete or make changes to content in HTTP requests or responses.

The responder module provides content filtering and advanced redirection of user requests. Based upon business need, incoming requests can be dropped or forwarded. Or NetScaler can respond with a custom-created page or send redirects back to the browser with instructions to request an alternative URL.

Finally, surge protection capabilities maintain full application availability even during unexpected surges in client requests.



Maximize current investments, and reduce bandwidth and operating costs

NetScaler cuts application delivery costs by reducing the number of servers required and reduces web application bandwidth requirements through optimization technologies such as caching and compression. This enables organizations to:

- Cut monthly network costs and increase users without incurring large capital costs for more bandwidth
- Reduce TCO by extending the life of current hardware investments, improving the utilization of IT infrastructure and reducing the number of application servers the network needs
- Shift IT budget from maintaining existing systems into funding new strategic initiatives

Improve security and effortlessly comply with regulations

Protecting web applications from application-layer attacks is critical for any application that contains sensitive corporate or customer information. Traditional security products such as network firewalls and IPS devices are very important for network security, but they do nothing to stop web application attacks.

Request switching technology enables NetScaler to inspect application requests and identify malicious content, stopping it before it reaches the WebSphere Portal application server. NetScaler provides comprehensive attack protection from DoS attacks, Distributed DoS, network-based worms and viruses, and application-specific vulnerabilities.

NetScaler includes robust application-layer security. Citrix® Application Firewall™ provides application-layer protections against attacks such as cross-site scripting, forceful browsing, cookie poisoning and SQL injection that are used to steal valuable corporate and customer information. The solution also includes protections against L4 and L7 denial of service (DoS) attacks. The Responder Module enhances application security by enabling granular filtering of incoming requests.

Conclusion

The increasing use of web portals to aggregate and deliver corporate applications conveniently and simply, coupled with globalization, datacenter complexity, chatty applications and increasing government regulations have driven the need for optimization solutions that can ensure high application availability and performance.

ANPO and Citrix NetScaler together are the perfect answer to these seemingly overwhelming concerns. Together, ANPO and NetScaler improve application response times, ensure availability for users, defend against application-layer attacks and lower costs.



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About Citrix

Citrix Systems, Inc. (NASDAQ:CTXS) is the leading provider of virtualization, networking and software as a service technologies for more than 230,000 organizations worldwide. Its Citrix Delivery Center, Citrix Cloud Center (C3) and Citrix Online Services product families radically simplify computing for millions of users, delivering applications as an on-demand service to any user, in any location on any device. Citrix customers include the world's largest Internet companies, 99 percent of *Fortune* Global 500 enterprises, and hundreds of thousands of small businesses and prosumers worldwide. Citrix partners with over 10,000 companies worldwide in more than 100 countries. Founded in 1989, annual revenue in 2008 was \$1.6 billion.

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