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Business Benefits of the NetScaler Application Delivery Controller

The key to reducing IT costs while enabling key business initiatives now and in the future

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Executive summary

Today's CIOs are under tremendous pressure to closely control IT costs, especially given the precarious state of the global economy. Accomplishing this goal is not easy, however, because it must be done without compromising the ability to fulfill other, core objectives. In particular, meeting the needs of today's business also requires being able to:

- Accommodate a rapidly increasing number of new web applications that are placing an enormous load on the network and datacenter infrastructure;

- Ensure the security, availability, and performance of all these applications — many of which incorporate newer Web 2.0 technologies to deliver real-time interaction and other collaborative capabilities;

- Establish a high degree of flexibility and agility, such as that promised by cloud-computing architectures; and,

- Support key initiatives now and in the future, including greater mobility and geographic dispersion of the workforce, increasing consolidation and virtualization of IT resources, and the steady transformation to fully dynamic datacenters.

This paper is a high-level guide to help IT and business managers understand the business benefits conveyed by the Citrix NetScaler web application delivery controller. An all-in-one solution featuring a comprehensive set of application delivery capabilities, NetScaler allows today's organizations to meet many of their leading IT and business-related objectives. With NetScaler, application delivery and related infrastructure and operating costs can be substantially reduced — often by 50 percent or more. At the same time, the rollout of new applications is simplified and accelerated, IT security risks are reduced, user productivity and customer satisfaction are increased, and game-changing initiatives such as embracing virtualization and cloud computing are not just supported, but actually enabled.

Summary of NetScaler Business Benefits

And the Capabilities and Characteristics that Enable Them

Reduces Infrastructure & Operating Costs
Server offload and optimization
Network offload
Optimized XenDesktop/XenApp deployments
Seamless integration and compatibility
Reduces Application Delivery Controller TCO
All-in-one solution
Choice of platform
Flexible licensing
Highly efficient administration
An extensible, modular design
Reduces IT Security Risks
Robust application security
Integral network-level protection
Increases User Productivity & Customer Satisfaction
Server and site-level high availability
Accelerated application performance
Increases IT/Business Agility and Enables Key Initiatives
Streamlined application delivery
Secure Web 2.0 enablement
Secure remote access
Virtualization and cloud ready

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The Business Value of NetScaler

Unlike other approaches that require multiple point products, NetScaler is a fully integrated, all-in-one web application delivery controller (ADC). Deployed in DMZs, datacenters, and in front of web servers, NetScaler combines local server and global site-level load balancing with multiple mechanisms for accelerating application performance, advanced offload capabilities for servers and other network infrastructure, and comprehensive application security — including a full-featured SSL VPN and a robust application firewall.

With multiple product versions — Standard, Enterprise, and Platinum — IT managers can select and pay for the specific set of functionality that best meets their technical needs and still fits within their budget. A similar degree of flexibility also applies to system performance and the underlying platform on which the solution runs. Organizations can choose from a family of built-for-purpose NetScaler MPX hardware appliances and software-based VPX virtual appliances that span a range of performance levels, from 10 Mbps to 50 Gbps. Functional parity between the two platform options, coupled with an extensive set of enterprise-class management capabilities, ensure a consistent solution that is easy to deploy, manage, and operate.

Most importantly, it is this rich set of technical capabilities and operational characteristics that enables NetScaler to deliver a compelling set of business-oriented benefits. These include, reduced infrastructure and operating costs, reduced TCO for the application delivery controller itself, reduced IT security risks, greater user productivity, higher customer satisfaction, and the ability to enable key business initiatives both now and well into the future.

Reducing Infrastructure and Operating Costs

Significant reductions to the amount of infrastructure that must purchased, operated, and maintained to deliver today's web applications are made possible by NetScaler's extensive server and network offload capabilities, its ability to optimize Citrix XenDesktop and Citrix XenApp implementations, and its ability to seamlessly fit into and leverage the environment around it.

Server offload and optimization. By offloading processing for functions that servers don't handle very well — such as TCP connection setup and management, HTTP content caching, and data compression — NetScaler enables more applications to be delivered to more users with far fewer servers. Greater server efficiency is also achieved via server specialization and support for dynamic workload management.

- **Server specialization** — With Layer 7 load balancing, also known as content switching, traffic management decisions can be based on application-layer attributes, such as the type of content being requested by a user. This allows different application components to run on separate servers, each tuned for a specific component - instead of running all of them on a larger set of generically configured systems.

- **Dynamic workload management** — When operated in conjunction with Citrix XenServer for server virtualization and workflow orchestration tools such as Citrix Workflow Studio, NetScaler supports the ability to automatically adjust server workloads and provision/de-provision additional servers based on real-time application demands. IT departments, therefore, no longer need to over provision per-application to meet high availability and peak load requirements. They can instead leverage a single server resource pool across numerous applications.

The net result of these capabilities is that server requirements and associated costs can be reduced by up to 80 percent. In practice, new server investments can be deferred as existing units are able to support more users, a greater volume of traffic, and more applications.

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Network offload. NetScaler reduces the requirements and load for other datacenter infrastructure as well, not just servers. For instance, an extensive collection of optimization and compression mechanisms help shrink the amount of network traffic each application session generates. This effectively reduces the load on all elements in the network path between clients and back-end servers, including switches, routers, firewalls, Internet connections, and so forth. Once again, the practical result is not necessarily less of all of these items, but rather a significant delay in the need for investments to acquire additional capacity or improve performance. In addition, the need for fewer servers when using NetScaler helps reduce the size/number of network switches — or at least offset increased requirements resulting from datacenter consolidation — since fewer physical ports are needed to support a given load.

Optimized XenDesktop and XenApp deployments. Optimization for Citrix desktop and application virtualization implementations occurs in two distinct ways. First, organizations can consolidate infrastructure by running a full-featured Web Interface service of XenDesktop/XenApp directly on NetScaler MPX hardware appliances. This approach also improves security by leveraging a hardened platform and eliminating the need for firewall openings to enable communication with DMZ-based Web Interface servers.

The second benefit involves high availability and the overall resilience of an organization's XenDesktop and XenApp deployments. By using application-level health checks, NetScaler ensures not only that essential Web Interface and XML Broker servers are running, but also that the corresponding services are in fact operating properly. The result is considerably fewer disruptions to critical business processes and greater levels of both user and customer satisfaction.

Seamless integration and compatibility. Support for a wide range of management, authentication, and networking technologies — including IPv6 — helps ensure that NetScaler can fit into practically any environment without the need for disruptive changes or additional expenditures. An open architecture and extensive integration capabilities also ensure IT managers have every opportunity to enhance the value of other application delivery, infrastructure, and security management solutions in which investments have been made.

Reducing ADC Total Cost of Ownership

The cost benefits discussed to this point have been applicable to an organization's computing environment at large. But NetScaler also reduces total cost of ownership compared to competing application delivery controllers, based on the following capabilities and characteristics:

All-in-one solution. NetScaler provides a comprehensive suite of application delivery capabilities in a single, integrated platform. In comparison, other application delivery solutions typically require numerous, separate physical devices to accommodate certain value-add sets of functionality, such as global server load balancing, web application firewall, and SSL VPN. The result is that with NetScaler, organizations obtain a solution that is easier to deploy and costs less in terms of training, support, ongoing management, datacenter power, and datacenter space.

Choice of platform. For high-end/high-scalability use cases, latency sensitive applications, and instances where server offload is a top priority, IT departments will want to deploy purpose-built MPX-series hardware appliances. For all other scenarios, significant cost savings can be realized by taking advantage of software-based VPX virtual appliances leveraging off-the-shelf server hardware. A full-featured alternative with lower price points and the ability to re-use existing server hardware, NetScaler VPX is a highly capable yet affordable solution. With it, organizations can compound cost reductions by economically extending ADC functionality into more domains than ever before — such as application test and development environments — while also tapping into the efficiency and automation gains derived from having an increasingly virtualized computing infrastructure.

Flexible licensing. Traditional approaches for ensuring sufficient ADC capacity incur either a front-end cost associated with over-provisioning, or a back-end cost stemming from the need for disruptive hardware upgrades. NetScaler Pay-As-You-Grow is an innovative licensing model that solves this dilemma. It allows customers to purchase a NetScaler appliance that meets their near-term performance and capacity requirements with the confidence that they can easily and quickly scale their implementation in the future without costly hardware replacements. When the need for more capacity arises, a simple software license upgrade is all that it is required to unlock additional levels of performance. The result is greater investment protection, less impact on users and critical business operations, and reduced TCO.

For example, consider an IT department with an initial throughput requirement of 500 Mbps and an expected traffic growth rate of 15 percent annually that initially purchases a redundant pair of web application delivery controllers with 1 Gbps capacity. Given a reasonable steady-state utilization limit (e.g., 75 percent), this organization will need to replace its solution within 3 to 4 years. In comparison, with NetScaler Pay-As-You-Grow licensing additional capacity can be provisioned at any time, there is no need for a highly disruptive hardware upgrade, and the net cost and impact to the business is less.

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Highly efficient administration. Initial implementation and ongoing administration are simple and straightforward. Included at no additional cost with most editions of NetScaler, Citrix Command Center is a centralized console that provides robust "fleet management." Multiple, distributed NetScaler ADCs can be managed simultaneously, while delegated administration facilitates localization of policies and configuration settings. This is complemented by an intuitive policy framework that unifies and simplifies configuration tasks for related capabilities, an extensible and fully customizable set of pre-defined application templates, and several time-saving configuration wizards.

An extensible, modular design. A modular design, extensible architecture and multiple packaging options deliver economic efficiency and investment protection. With NetScaler, organizations can purchase just the functionality they need, when they actually need it, and new capabilities can be developed and introduced at any time without having to deploy a steady stream of additional, standalone products.

Optimized support for 2048-bit RSA keys is another important advantage of NetScaler. This is particularly true given the National Institute of Standards and Technology's (NIST) recommendation to move from 1024-bit keys to 2048-bit keys by the end of 2010 in order to maintain adequate security for web sites and applications that utilize SSL to protect sensitive data and transactions. By delivering a 5X increase in SSL transactions per second, NetScaler provides organizations with a solution that significantly reduces the additional infrastructure investment required to support 2048-bit RSA keys.

Reducing IT Security Risks

NetScaler helps reduce IT security risks and ensure compliance with privacy and data security regulations by providing an integral set of application and network-level security capabilities.

Robust application security. The cornerstone of the NetScaler security capabilities is an integrated application firewall that protects organizations from application-layer attacks and helps prevent the loss of valuable corporate and customer data. This is complemented by a comprehensive set of authentication, authorization and auditing (AAA) features and a full-featured SSL VPN solution that enable fine-grained control over which users have access to which applications under which conditions.

Integral network-level protection. Access control lists (ACLs) and robust TCP connection handling routines that thwart many types of DDoS/flood attacks ensure that protection is also provided at lower layers of the computing stack.

The resulting benefits include a stronger compliance posture, fewer successful attacks, and thus reduced costs to your business — such as remediation, customer notification, data loss, damaged customer confidence, loss of competitive advantage, and potential fines or punitive damages.

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Increasing User Productivity and Customer Satisfaction

Guaranteeing the availability of applications and accelerating their performance are key points of emphasis for NetScaler, and are clearly among the top considerations when it comes to ensuring a positive user experience and maximizing productivity.

Server and site-level high availability. Non-stop access to applications is the product of intelligent traffic management methods enabled by advanced load balancing algorithms, detailed application-layer health checks, content switching, and session persistence. It is also a result of NetScaler Global Server Load Balancing (GSLB). By extending core load balancing capabilities so they are applicable across multiple datacenters, GSLB not only overcomes site-level outages and performance issues, but also helps address corporate business continuity and disaster recovery objectives.

Accelerated application performance. A combination of high-efficiency compression, dynamic content caching, and HTTP protocol optimization delivers significantly faster response times for all web applications over all types of network connections. An integral performance monitoring tool, EdgeSight for NetScaler, also helps by non-intrusively measuring and reporting end-to-end performance issues before they become large-scale problems.

Increasing Agility and Enabling Key Initiatives, Now and in the Future

Another major way that NetScaler benefits the business is by enabling key technology initiatives, which are themselves intended to reduce costs, increase productivity, improve competitiveness, better meet customer needs or otherwise help generate greater revenue.

Streamlined application delivery. With NetScaler, everything needed to securely and reliably deliver web applications is available in one convenient package. As a result, organizations can quickly respond to new business opportunities that depend on the deployment of new applications with the utmost confidence that these applications will operate in an efficient and effective manner.

Secure Web 2.0 enablement. Web 2.0 applications featuring real-time interaction and collaboration can deliver enormous benefits to enterprises, including improved customer intimacy, better employee productivity, and streamlined business processes. However, they are also relatively risky, due to a greater potential for data loss, the powerful yet immature technology upon which they rely, and the complicated trust scenarios often involved. NetScaler helps mitigate these issues by providing an integral application firewall that includes extensive coverage for Web 2.0 technologies, including XML and AJAX. NetScaler application acceleration capabilities also extend into the Web 2.0 domain, delivering a much-needed performance boost for the great number of these applications that are inherently sensitive to latency.

Secure remote access. Increasing user mobility, teleworking, datacenter consolidation, out-tasking, and geographic expansion are just a handful of the business-driven initiatives that require organizations to support remote users. NetScaler conveniently and cost-effectively meets this need by incorporating a full-featured SSL VPN that enables any user operating from any location with any device to securely access any application.

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Virtualization and cloud-ready solution. Virtualization and cloud computing are two of the hottest developments in IT service delivery. This is due to their tremendous potential to reduce cost of ownership, improve responsiveness and agility, and ultimately transform IT by allowing leadership to focus on managing results rather than the underlying infrastructure. NetScaler supports related initiatives by both enterprises and service providers in several important ways.

- **A good "virtual citizen"** — With NetScaler VPX, crucial ADC functionality can become part of an organization's virtualized computing infrastructure, rather than remaining external to it. IT managers can progress from virtualizing servers and applications to also virtualizing a key component of their network infrastructure, and in doing so can fully capitalize on the overall affordability, deployment flexibility, and ease of implementation, management, and maintenance that characterize virtual appliances. With VPX, virtualized ADCs can be rapidly deployed anywhere in an organization's datacenter. Moreover, IT obtains a solution that fits into the longer term strategy of having fully dynamic datacenters.

- **A key element for cloud development** — The leading features and strengths of NetScaler are well-aligned with core characteristics of cloud computing solutions. For example: load balancing, content switching, Pay-As-You-Grow licensing, and dynamic provisioning all help achieve agility and dynamic scalability; high availability and application acceleration features facilitate responsiveness and a positive user experience; and a rich set of multi-tenant capabilities, support for web services technologies, and programmatic management interfaces all help meet the need for broad-based applicability and a high degree of manageability.

- **A catalyst for cloud adoption** — NetScaler makes it easier for enterprises to embrace cloud-hosted applications. To begin with, hybrid cloud options become more attractive as organizations are able to attach, ship, and implement essential ADC functionality alongside the applications it serves whenever those workloads are migrated to the cloud. Then there is Citrix OpenCloud Access. By enabling enterprises to seamlessly extend the identity of internal users into a service provider's domain, OpenCloud Access significantly reduces the upfront work typically required to implement both Software-as-a-Service (SaaS) applications and potentially transformative Infrastructure-as-a-Service (IaaS) offerings.

Conclusion

An all-in-one application delivery controller, Citrix NetScaler helps today's CIOs tackle the challenge of containing IT costs while continuing to meet the needs of the business. NetScaler makes it easy and affordable to accommodate the explosion of new web applications, the growing popularity of Web 2.0 technologies, and a wide range of other trends and strategic initiatives, including greater mobility and geographic dispersion of the workforce, increasing consolidation and virtualization of IT infrastructure, and the steady adoption of SaaS and IaaS-hosted applications. The net result for organizations that leverage NetScaler is the realization of a number of key business-oriented benefits:

- Extensive server offload and optimization capabilities enable server costs to be cut by half, or more

- Powerful compression and traffic optimization functionality allow businesses to defer investments necessary to obtain additional capacity for related network infrastructure (e.g., routers, switches, Internet connections, security gateways)

- An integrated solution featuring choice of hardware or low-cost virtual appliances trims ADC cost of ownership while allowing associated technical benefits to be affordably extended to additional use cases

- Integral network and application-level security mechanisms significantly reduce IT risk stemming from vulnerable web technologies and the associated potential for data loss

- Accelerated application performance not only boosts user productivity, but customer satisfaction as well

- Server and site-level high availability features facilitate essential continuity-of-operations objectives

- A modular design provides investment protection, ensuring applicability of the solution both now and well into the future

- The ability to rapidly rollout new web applications, securely enable Web 2.0 technologies, and fully support emerging cloud computing solutions dramatically enhances IT/business agility while paving the way for highly automated datacenters of the future

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