



NetScaler VPX – The power to flexibly and dynamically implement advanced Web application delivery services

Executive summary

As Web applications have evolved from simple publishing applications to straightforward transactional applications to the rich, highly interactive Web 2.0 applications of today, ensuring their performance, security and availability has become both more important and more complex.

At the same time, IT organizations are under tremendous pressure to control costs while still retaining the capability to rapidly and flexibly respond to business needs. To meet these demands, most IT shops are embracing virtualized infrastructure—an approach that facilitates device consolidation, reduces costs and introduces the ability to flexibly shuffle resources on-demand.

Citrix® NetScaler® VPX—a virtual appliance providing the same Web application delivery features as Citrix® NetScaler® appliances but running on Citrix® XenServer™—lets IT organizations harness all the power and flexibility of a dynamic, virtualized datacenter to not only deliver Web applications, but also provide the advanced acceleration, security, availability and offload services essential to controlling costs and optimizing resource utilization and performance.

When using NetScaler VPX to provide Web application delivery services, IT organizations will get increased:

- *Physical flexibility* by gaining the ability to leverage already in-place server hardware to provide processing capacity.
- *Functional flexibility* by using NetScaler physical and virtual appliances together to separate high-volume shared network services from application-specific Web application delivery needs.
- *Operational flexibility* by being able to spin-up/spin-down NetScaler instances on-demand anyplace within their dynamic datacenter.
- *Financial flexibility* and investment protection by having the ability to purchase only the capacity that is needed and to easily add further capacity as required.

Dynamic Web applications and dynamic infrastructure

In addition to the broader challenges of having to do more with less while still managing to enable the business, CIOs also need to account for the fundamental changes and advances in Web applications, as well as the technology, infrastructure and techniques used to build, deliver and support them.

The evolution of Web applications

As the Web has evolved from novelty to an ingrained part of our collective conscience, Web applications have evolved along the following trajectory:

- Publishing – Web applications are used to improve the accessibility of relatively static data and information (e.g., product data sheets, company profiles and user guides).

- Transactions – Web applications are used to process transactions. Instead of just having their catalogs online, organizations can actually conduct business (e.g., sell products, manage their supply and distribution chains, and enable customer/constituent self-service).
- Interactions – Web applications are used to achieve real-time interaction and ever-increasing degrees of collaboration, thereby providing new approaches for a host of conventional business processes (e.g., disseminating information and gathering feedback, real-time communication, evaluating plans and designing products).

The increased functionality and business value that accompany each new phase has resulted in greater dependency by organizations on their Web applications, along with greater application and infrastructure complexity. This has elevated the importance of the underlying infrastructure and associated services responsible for application delivery. In other words, ensuring the availability, performance and security of Web applications is not just desirable, it has become imperative.

There are some derivative implications that require attention as well. First, as Web applications become more complex and specialized, so do the requirements for maintaining adequate levels of performance, security and availability. Achieving maximum gains, therefore, is now dependent on the ability to tune application delivery services to the unique characteristics and needs of each individual application.

The second item to consider is that the ubiquitous nature of Web applications means that application delivery is critical to organizations of all sizes. This highlights the need for an application delivery solution suitable for organizations with department level and smaller, more moderately sized Web implementations.

The evolution of application infrastructure

Paralleling the evolution of Web applications is the following evolution of the underlying network and datacenter infrastructure.

- Isolated silos – Each application is serviced by a largely if not completely independent set of infrastructure including security gateways, network devices, servers and back-end components (e.g., databases and directories).
- Shared network services – A degree of consolidation is achieved by architecting solutions to take advantage of capabilities such as VLANs, routing techniques, and realms/domains that yield low-level isolation, thereby enabling applications with similar requirements to share certain front and back-end resources (e.g., connectivity, networking devices, storage systems and directories).
- Shared server hardware – Server virtualization technology is employed to achieve even further sharing and consolidation of computing resources, as well as to enable dynamic repurposing of server hardware in response to changing conditions.

- The dynamic datacenter – The concepts of having shared resources and dynamically repurposing and reprogramming computing infrastructure are extended to encompass all components of the datacenter and, to a large extent, distributed enclaves as well.

Once again, the implications are what matter most. The most significant of these is that achieving greater degrees of adaptability and responsiveness requires progressively more infrastructure components and services to, at a minimum, support highly virtualized environments and, ideally, be available in virtualized form themselves. This includes the application delivery services discussed in the previous section.

Introducing NetScaler VPX

A new addition to the NetScaler product family, NetScaler VPX is a virtual appliance version of the market-proven NetScaler Web application delivery solution. NetScaler VPX enables IT organizations to:

- Provide availability, security, acceleration and offload for their Web-based applications, using the same set of services available in NetScaler appliances.
- Run these Web application delivery services within the context of their emerging virtualized infrastructures, enabling them to leverage all the flexibility and dynamism that such an approach provides.

NetScaler VPX can be deployed on any hardware platform running the XenServer server virtualization system and incorporates *all* of the services provided by NetScaler Platinum Edition (see <http://www.citrix.com/netscaler>). Furthermore, Citrix Command Center can be used to centrally manage and monitor both NetScaler VPX virtual appliances and NetScaler physical appliances. In fact, the only functional differences between NetScaler VPX and NetScaler appliances pertain to performance and system capacity.

Specifically, maximum throughput for NetScaler VPX currently tops out at 1 Gbps although the actual performance obtained with any given system will depend on the underlying hardware provisioned by the customer. In addition, NetScaler VPX does not include hardware specifically designed to support SSL acceleration. NetScaler VPX can still terminate SSL sessions but, unlike with NetScaler appliances, the associated processing is not offloaded to dedicated silicon.

The net result is that with NetScaler VPX, IT organizations can:

- Easily deploy NetScaler to make all their Web applications faster, more secure, more available and cheaper to run.
- Harness the power and efficiencies of off-the-shelf hardware and their virtualized, dynamic datacenters in doing so.

The advantages of NetScaler VPX

NetScaler VPX enables IT departments to implement application availability, security and acceleration services on-demand anywhere within private or hosted cloud-based networks and datacenters. A complementary solution to NetScaler appliances, it also helps reduce datacenter costs and complexity by

offloading servers and other infrastructure components, thereby trimming the number of devices that organizations are required to purchase, implement, accommodate, power, cool and maintain. As a virtualized solution, however, NetScaler VPX also conveys an unmatched degree of flexibility.

Physical flexibility:

Leveraging in-place processing capacity

With NetScaler VPX, there is no physical appliance to deal with. The NetScaler VPX distribution package is easily downloaded and there is no need to rack and stack a new set of boxes. IT can take full advantage of virtualized servers and associated resources that are already in place. Indeed, a convenient by-product of this approach is that new application delivery controllers can now be deployed on-demand. Furthermore, they can be physically located practically anywhere in any network or datacenter. Because service providers need not be in possession of a specific appliance, Web applications, *complete with all of their associated application delivery functionality*, can even be migrated/offloaded to *the cloud*—either on a permanent or temporary basis as required to address an organization's needs and preferences.

Another aspect of the physical flexibility of NetScaler VPX is that there is no dependency on the specific type of server hardware that is used. The only requirement is that the system be capable of running XenServer. To the extent performance requirements can be met, this means enterprises are free to exploit low-cost, commodity server platforms. At the other end of the spectrum, service providers now have the option to utilize whatever special-purpose hardware—for example, NEBS compliant or DC-powered systems—from whatever source best meets their needs or internal standards.

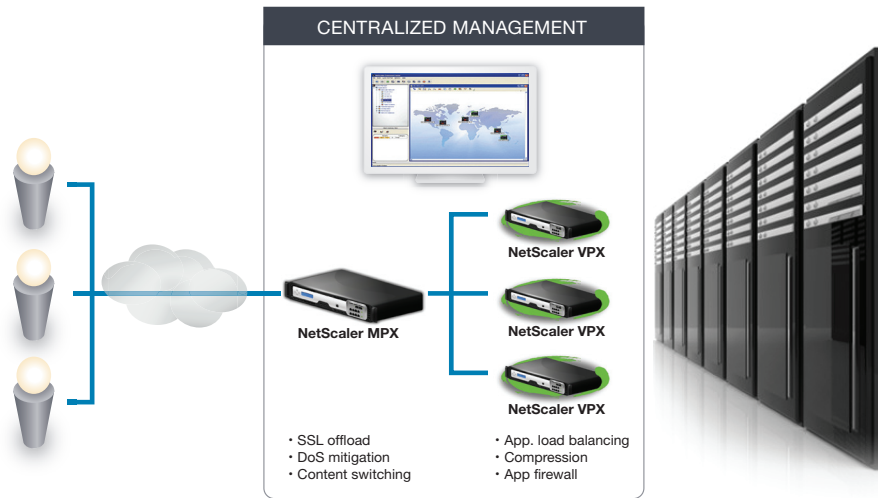
Functional flexibility: The Web application delivery fabric

Attractive licensing options and the ability to take advantage of low-cost commodity hardware makes it not only possible but often advisable to split application delivery capabilities out into separate instances, especially for complex applications or ones with extremely large user populations.

As a general rule of thumb, Web application delivery controllers capable of processing 15-20+ Gbps of traffic are a significant investment. By itself this is not a problem; it's a relatively well-known and widely accepted situation. However, it does lead to a very real issue when a high-capacity solution is tasked with performing a lot of advanced operations that are relatively compute intensive, such as compression, complex rewrites and other application-layer inspections. Depending on the breadth and depth of the services that are performed, this will cause a significant drop in overall throughput. The result is that IT frequently needs to make a choice: compromise in terms of the functionality that is employed or purchase additional units to make up the difference.

NetScaler VPX, however, enables a different approach. IT organizations can mix physical and virtual appliances to create a Web application delivery fabric. Specifically, NetScaler appliances can be deployed at the datacenter edge to address high-capacity network-wide actions while NetScaler VPX can be deployed, on-demand, deeper within the datacenter core to handle application-specific processor intensive actions. This provides the lowest TCO and greatest flexibility. By exploiting the specific strengths of both

physical and virtual appliances, the resulting Web application delivery fabric enables maximum functionality and flexibility at minimum cost.



Further key advantages of this approach include:

- The ability to tune advanced delivery capabilities to meet the requirements of each specific application, *and* to execute the associated services without degrading overall network performance or impacting the ability to support other applications.
- The ability to separate and isolate application delivery services along different boundaries to account for organizational, political and business-driven dynamics and realities—for example, based on who *owns* which resources, who is responsible for managing which resources, and which applications and system are deemed critical to the business.
- Increased portability of applications, along with the services used to enhance and secure their delivery.

Operational flexibility:

Web application delivery infrastructure on-demand

The physical and functional flexibility discussed so far establishes the foundation for achieving an unmatched degree of operational flexibility as well. In particular, NetScaler VPX enables organizations to *dynamically* provision crucial application delivery services in support of dynamically provisioned Web applications. With NetScaler VPX, individual applications and the functionality required to ensure their availability, performance and security can be spun up, spun down and even migrated as conditions dictate. Responsiveness is enhanced at the same time that the use (and re-use) of computing resources is optimized.

In addition, because the key components of the solution now take the form of software, IT can more readily leverage existing datacenter processes to support and enable them. Appliance-based application delivery controllers are typically viewed as complex, specialized systems. Consequently, they often fall outside the scope of the formal IT processes used to manage and operate other resources, such as those pertaining to provisioning, change

control and chargeback. With NetScaler VPX, this is no longer the case. An application delivery controller is just another application and can be treated accordingly. The impact in this case is the potential for organizations to dramatically increase the efficiency of IT operations—including to the point that the spin up/down and migration processes discussed earlier can be fully automated.

Additional features that have long been part of the NetScaler solution can also be tapped to achieve even further gains. As noted in the preceding section, the functional flexibility of NetScaler VPX facilitates deployment of application delivery services on a per-application basis. This in turn amplifies the benefit derived from capabilities such as the AppExpert templates of NetScaler, its profile-driven installation routines and the granular, role-based administration supported by Citrix Command Center.

Financial flexibility: Investment protection

Last but not least, NetScaler VPX affords a measure of financial flexibility that any organization will undoubtedly come to value. The ability to easily upgrade licenses and swap out underlying hardware platforms to up-size or down-size an implementation as needed represents a considerable degree of investment protection, especially relative to fixed form-factor alternatives. In addition, a broad range of price-performance combinations ensures that there's a good fit for every use case, from small-to-medium and departmental implementations to those typical of larger enterprises and even service providers.

NetScaler: A solution for all scenarios

The addition of NetScaler VPX to the NetScaler product family ensures that organizations can obtain a NetScaler application delivery solution for practically any scenario that arises. Smaller shops can now obtain an enterprise-class application delivery controller at an attractive price point. Furthermore, organizations of all types can employ NetScaler VPX not merely to address but, instead, to fully embrace the ongoing evolution of Web applications, the infrastructure used to support them and the ways in which they are sourced. In this regard, NetScaler VPX enables IT departments to:

- Optimize Web application delivery infrastructure, by separating high-volume shared network services from processor-intensive, application-specific services.
- Improve operational efficiency, by facilitating and potentially even fully automating the process of provisioning a customized set of delivery services required to support new instances of Web applications (which themselves, may be dynamically provisioned).
- Automatically respond to periods of high demand by dynamically provisioning more capacity for an existing Web application and its related delivery services or, conversely, de-provisioning excess capacity when it's no longer needed.

- Migrate a Web application along with its related delivery services from one set of resources to another, including to a completely separate datacenter if appropriate, for example, when doing so would help optimize resource utilization or otherwise reduce operating expenses.
- Account for demand that exceeds the resources available at a given site by automatically spinning-up additional instances of a Web application and its related delivery services in a second datacenter, or at a cloud service provider's facility.
- Efficiently implement several tiers of application delivery functionality to support applications that are highly decomposed or have massive scalability requirements.

The bottom line is that NetScaler VPX extends the NetScaler product family, providing a cost effective and highly adaptable means to implement advanced application delivery services and thereby improve the availability, performance, security and TCO of an organization's business-critical Web applications. Itself a virtualized solution, NetScaler VPX supports the full spectrum of Web application infrastructures and deployment techniques, ranging from conventional designs involving dedicated physical hardware to the highly dynamic, highly virtualized approaches that have more recently emerged, along with the many possible permutations and combinations in between.



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