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The Guide to Multi-Dimensional ADC Scaling for Digital Transformation

Introduction

The world of IT is undergoing a digital transformation. Applications are growing fast, and so are the users consuming them. These applications are everywhere—in the datacenter, on virtual and/or microservices platforms, in the cloud, and as SaaS. More and more apps are now being moved out of datacenters to a cloud-based infrastructure.

In order for an optimized and secure delivery of these applications, IT needs specific network appliances called Application Delivery Controllers (ADCs). These ADCs come in hardware, virtual, and containerized form factors, and are sized by Network Administrators based on the current and future usage of applications. The challenge with this is that it's hard to foresee sizing or scalability requirements for these ADCs since users are constantly increasing, and applications are consistently evolving, as well as moving out of datacenters.

Complicating matters, most ADCs are fixed-capacity network appliances that provide zero or minimum expansion capability beyond their original capacity, so customers needing greater ADC capacity in the future have traditionally had to invest all their money on Day 0. Another option is to perform upgrades and install new appliances, but this process is very expensive, time consuming, and highly disruptive. Neither alternative is any better. Proactively over-provisioning consumes scarce capital budget, increases on-going support costs, and often results in substantial unused capacity.

These issues create the need for your ADC to enable true multi-dimensional scaling to dynamically manage your application delivery infrastructure end-to-end, and maximize your ADC investment. This eBook will explain what multi-dimensional ADC scaling is, its key use cases, and the considerations your organization should make when selecting a solution to support multi-dimensional ADC scaling in the face of digital transformation.

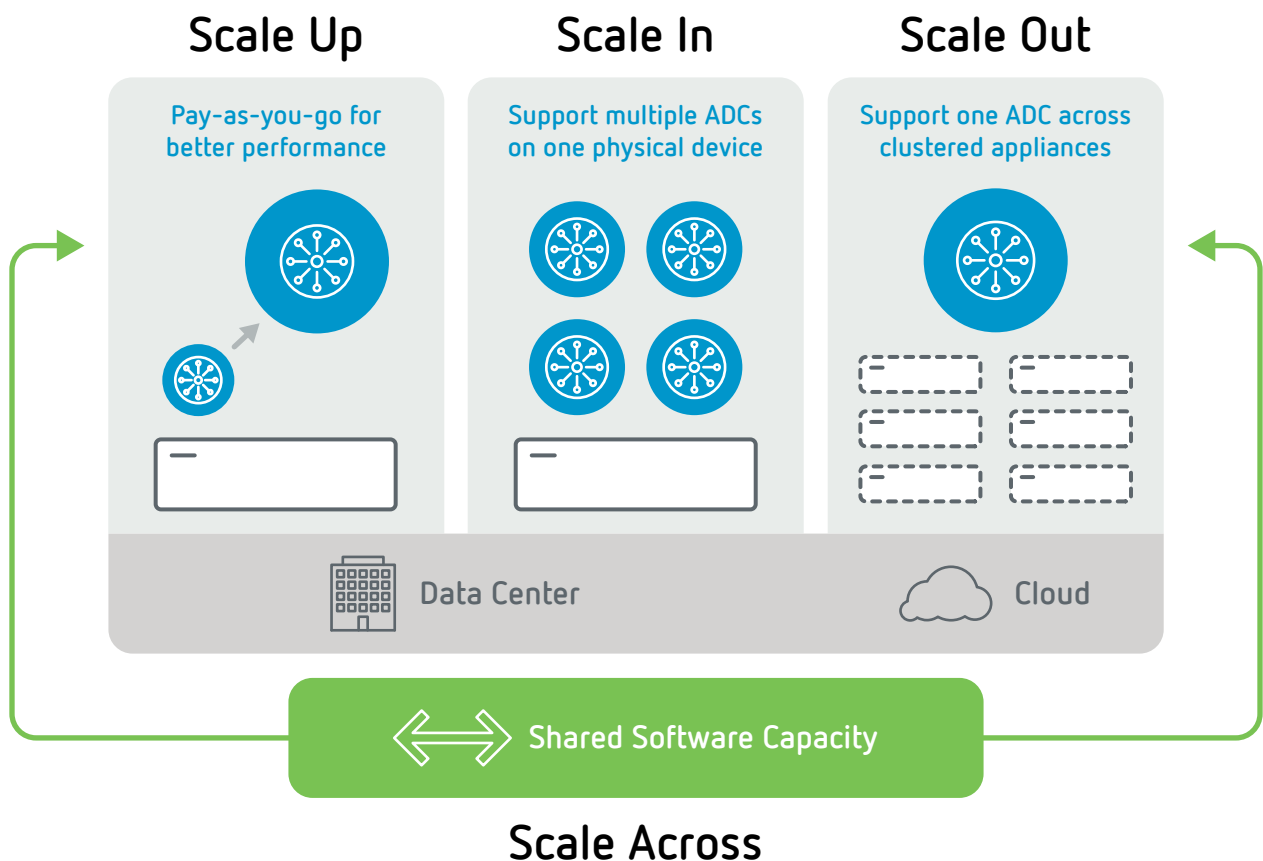# What is Multi-Dimensional Scaling?

Multi-dimensional ADC scaling is the ability to scale up, scale in, scale out, and scale across your application delivery infrastructure without the need to perform forklift upgrades. This means ADC instances scale as per the need of an application, automatically and on-demand.

Scale Up: Increase capacity of ADC appliances by just an update of a license file, without causing any downtime

Scale Out: Increase scalability with zero downtime and no idle network resources by clustering ADC appliances on the fly

Scale In: Simplify application delivery support to more applications and business units, putting an end to device sprawl and reducing TCO by consolidating ADC instances

Scale Across: Share software capacity across all ADC appliances anywhere in the cloud or in a datacenter, on-demand and as per the application requirements

Scale Up

Pay-as-you-go for better performance

Scale In

Support multiple ADCs on one physical device

Scale Out

Support one ADC across clustered appliances

Data Center   Cloud

Shared Software Capacity

Scale Across

It's important to note that scale up, out, in, and across are not mutually exclusive. IT can take advantage of them in whatever combination best meets their requirements. Furthermore, this solution is applicable to any enterprise, regardless of whether it's continuing to operate a traditional-style datacenter, actively transforming to an enterprise cloud, or embracing the concept of a full-featured service delivery fabric.

An ADC solution with these key capabilities unlocks true network agility and enables your organization to support a multi-dimensional ADC scaling model to effectively manage your application delivery infrastructure across all environments, embrace constant change, and turn the challenges presented by digital transformation into operational advantages.
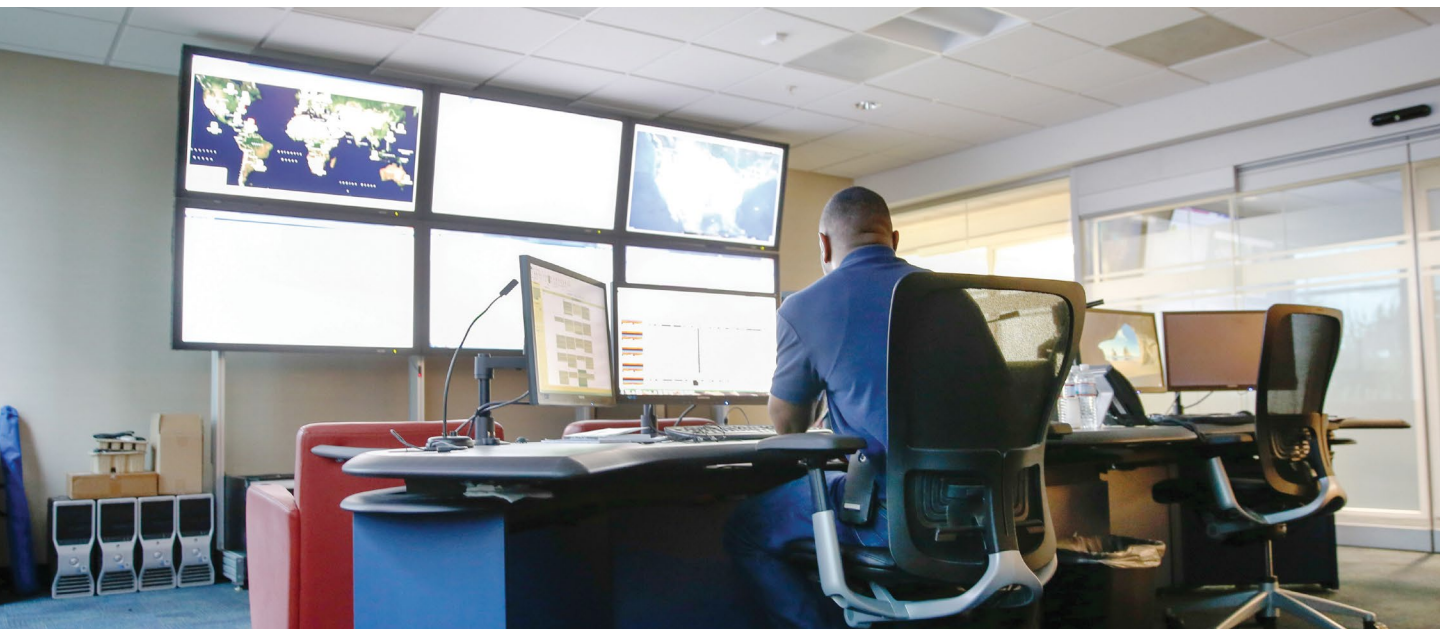
Use Cases for Multi-Dimensional ADC Scaling

Multi-dimensional ADC scaling unlocks the versatility and efficiency your organization needs to overcome the largest challenges presented by digital transformation. Some of the core use cases for a multi-dimensional application delivery scaling fabric are:

1 Transitioning from Hardware to Cloud or a Virtual Platform

To achieve agility, automation, and ease of management, most organizations are thinking of moving their workloads to a virtual or cloud-based solution. Whether it's to support new-generation application delivery, like DevOps microservices applications, or for the unlimited infrastructure that's available on demand, virtual and cloud models provide tremendous operational advantages.

The issue is, organizations that want to move to virtual or cloud solutions often find that the investment they made in hardware goes to waste with this transition, leading to high sunk costs. This prohibits them from upgrading or moving away from their existing hardware deployments until their next ADC refresh cycle. The resulting impact of this is a competitive disadvantage, leading to bottlenecks when attempting a transition to a virtual or cloud platform.

Pooled Capacity Licenses

Physical   Virtual   Cloud   Containerized

ADC

One Code Base
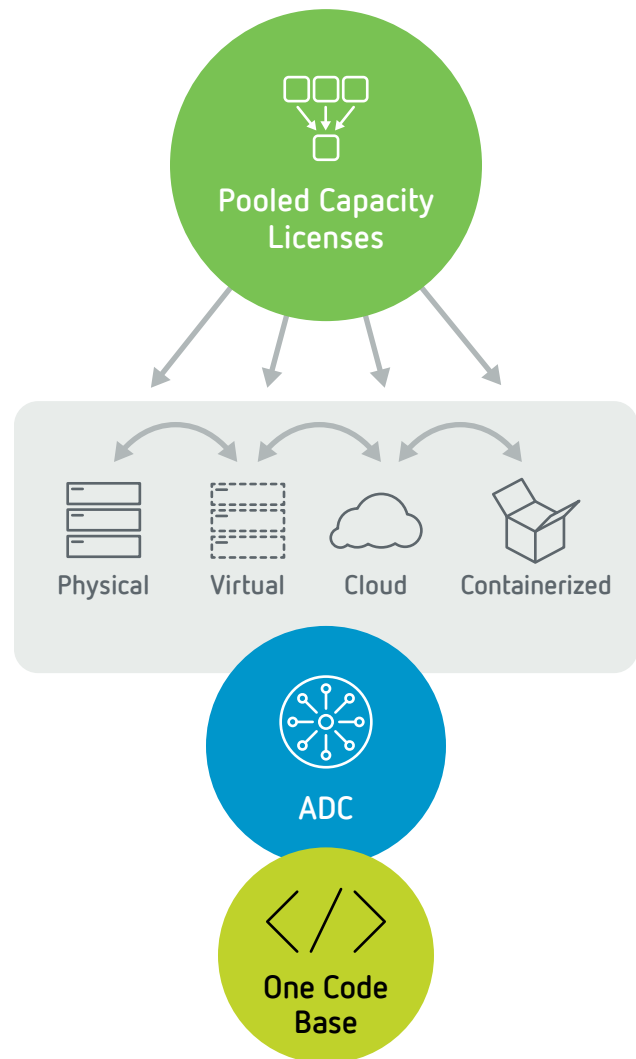
2 Bandwidth Requirements that Differ Across Datacenters, and at Different Times

Large enterprise customers that have datacenters across multiple locations in multiple time zones typically host applications in different datacenters to be closer to the users, and provide better performance, end user experience, and sometimes geo- or location-specific content.

Often, application bandwidth requirements may be the same all the way across for the same application deployed in a different datacenter, while varying by time of the day. For example, an application deployed in the US may have a maximum bandwidth requirement during the day, while at the same time, an application deployed in Asia may not require maximum bandwidth since it is nighttime and not many users are accessing it.

However, today, most customers have to purchase application delivery controllers assuming their maximum bandwidth requirements at all times. This is costly since customers purchase the biggest appliances required for an application across all the datacenters with no provision for customers to be able to share the bandwidth at specific times during the day.
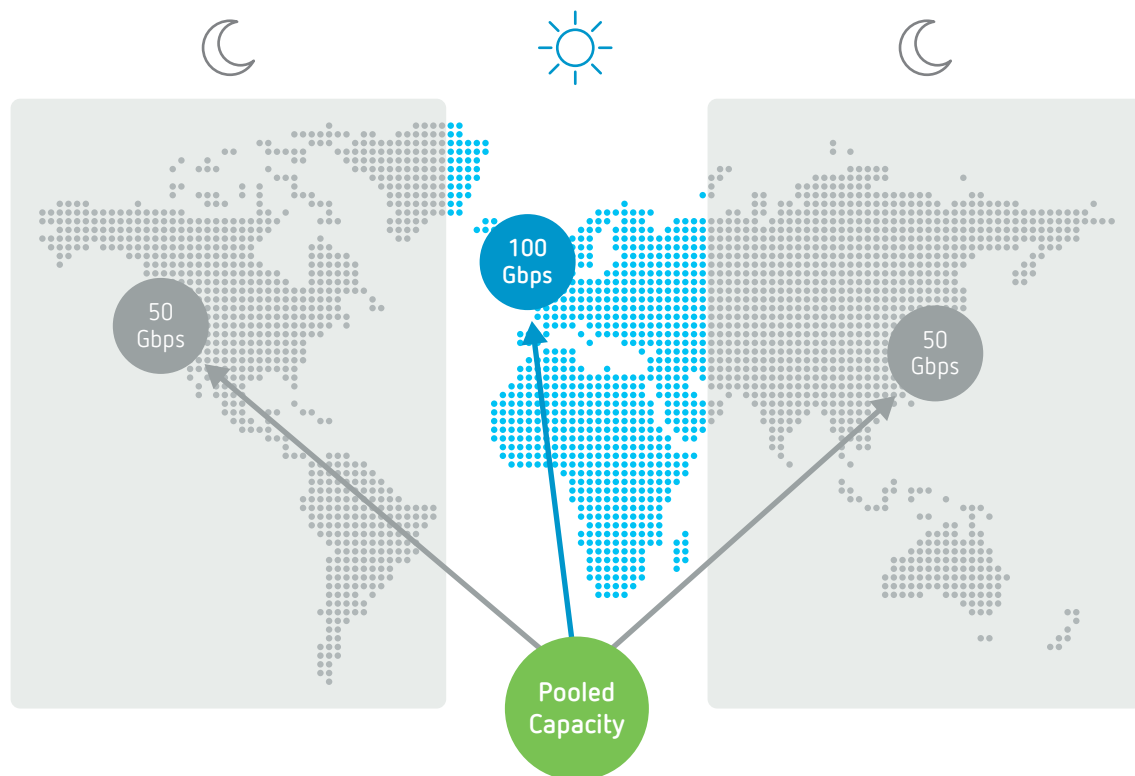
3 Shorter Refresh Cycles for ADC Appliances

Lately, we have seen major trends in hardware platforms. From requirements to build chipsets and NICs to support the latest encryption algorithms and higher throughputs, to developing higher processing power for performing complex functions, we have seen the refresh cycles reducing from a traditional 4−5 year cycle to 2−3 years. If a customer wants to own the latest and the greatest hardware, they have to replace existing hardware much sooner. Shorter refresh cycles obviously make it very costly for a customer, but they have to do it in order to meet new business or compliance requirements.

Better encryption

Improved speed and power

0 capacity devices
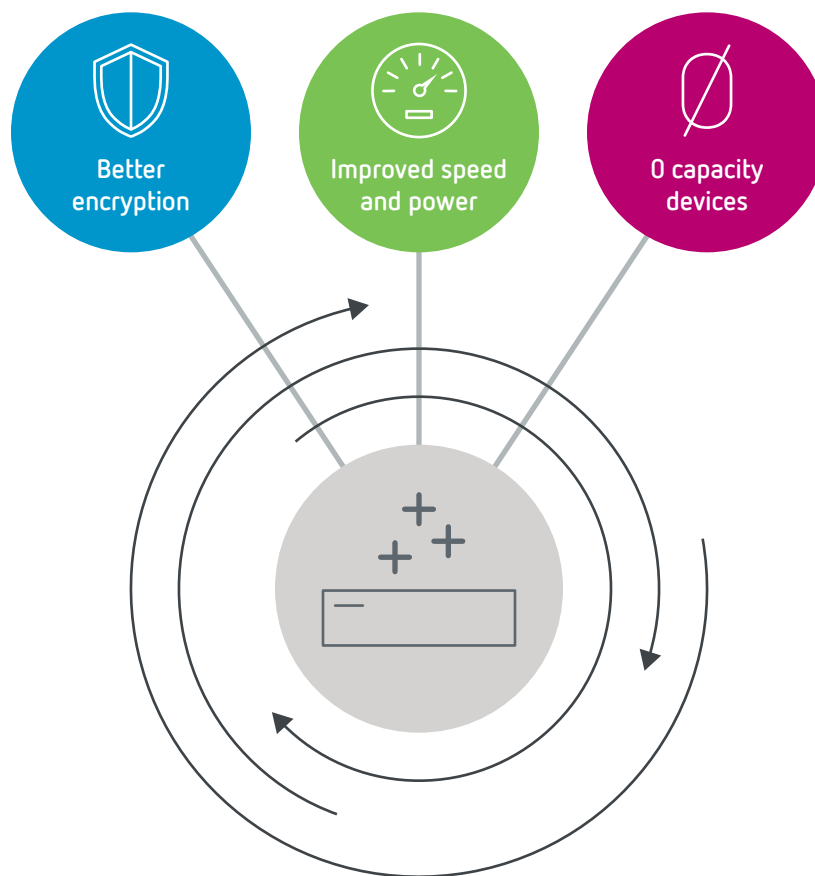
4 Consolidating Existing ADC Infrastructure

Enterprises moving to an agile and/or cloud-based model for deploying workloads have to consolidate their existing infrastructure. The challenge with consolidation is how to size an appliance that supports a multi-tenant solution. This challenge results in customers paying for an appliance that is too big for their initial rollout plans, and in some situations, committing upfront capex that may not be utilized for a while.
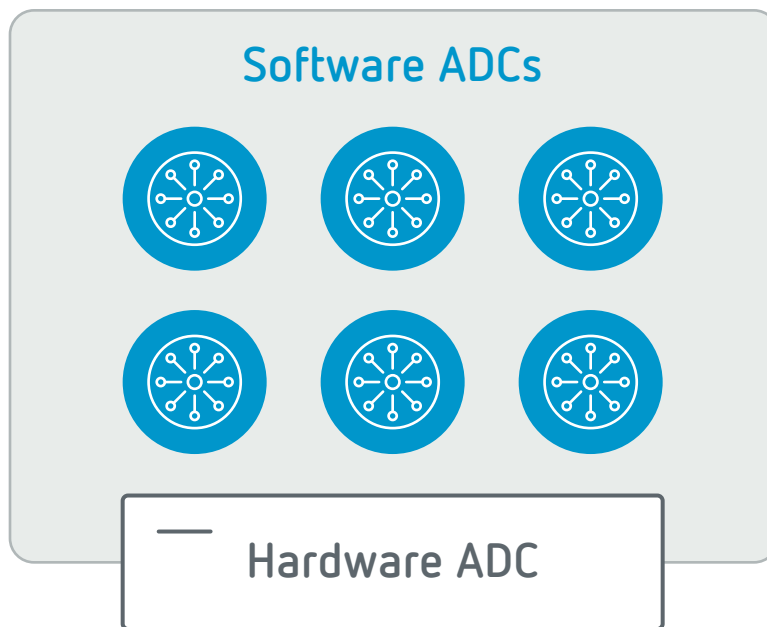
Key Considerations When Selecting a Solution to Support Multi-Dimensional ADC Scaling

Organizations looking for a solution to enable multi-dimensional ADC scaling should prioritize the following characteristics in an ADC:

- Physical, virtual, and containerized form factors to support a range of application environments

- Ability to share and port licenses across deployment instances, regardless of platform or environment

- Integration with a management system to provision and automate capacity across all ADC deployment instances

Additionally, enterprises or service providers looking to implement a multi-dimensional ADC scaling fabric should look to achieve:

- Leverage of their network as an enabling technology that can actually improve scalability and responsiveness when delivering applications and services

- Enablement of policy-based framework to share throughput capacity across all ADC appliances deployed in a cloud or in a datacenter

- Elimination of unused and under-utilized network resources with no reduction in reliability and lower total cost of ownership (TCO)

- Build of virtualization into mobile networks while also laying the foundation for service delivery fabrics capable of seamlessly delivering applications across networks and datacenters

A solution with these key characteristics and capabilities positions you to scale in, scale out, scale up, and scale across your entire network, end-to-end — in the cloud to on-premise in your datacenter — for true multi-dimensional ADC scaling, positioning your organization to embrace change with agility and cost efficiency.

Introducing Citrix NetScaler, the ADC Redefined for Multi-Dimensional Scaling in the Digital Transformation Era

Citrix NetScaler is an industry-leading application delivery solution that secures and optimizes application delivery from a datacenter or from a cloud based infrastructure. It ensures 100% application availability, enhances end-to-end application performance, secures applications by providing application layer attack protection, and improves application server efficiency — all in a single device, with unified, easy-to-define policies.

Citrix NetScaler TriScale[2] Technology extends this advantage by fully meeting the diverse and demanding scalability and flexibility requirements of the modern datacenter. Citrix TriScale[2] Technology uniquely incorporates multiple complementary methods for dynamically scaling application delivery infrastructure in response to changing application delivery requirements. Depending on an organization's specific needs at any given point in time, IT managers have the option to scale up, scale out, scale in, and/or scale across their entire application delivery infrastructure. These options are not mutually exclusive and can be used in any combination that best fits your requirements.

NetScaler TriScale[2] technology allows you to:

1 Transition from Hardware to a Cloud or Virtual Platform

NetScaler with TriScale[2] technology decouples software from underlying hardware, thus allowing software licenses to be easily portable, enabling you to Bring-Your-Own-Capacity (BYOC) to the cloud. This allows NetScaler to share resources like software capacity across all NetScaler form factors, irrespective of their location, across multiple datacenters or in a cloud, from a centralized location. For example, if you purchase a NetScaler hardware appliance, and one or two years down the road you decide to deploy a virtual appliance or move to cloud, you can transfer all or a part of the capacity from the hardware appliance to the new virtual or cloud-based appliances. This allows better utilization of resources and investment protection, and allows for a much more cost-effective upgrade.

2 Share Capacity Across Datacenters

If you have datacenters across the globe, NetScaler with TriScale[2] technology allows you to automate provisioning of bandwidth, maintained in a centralized repository, across all NetScaler appliances. You don't need to purchase maximum capacity ADC appliances across all your datacenter locations. NetScaler TriScale[2] allows a far more efficient usage of your ADC infrastructure. For example, if you have two datacenters, one in the US and other in India, the bandwidth requirements in the two datacenters may vary depending on the time of day. During the day in the US datacenter, bandwidth requirements may be at their peak. The bandwidth requirement may reduce at night in the US, but may be high during the day in India (while it's night in the US). An IT admin can, in this case, set up a policy to provision and de-provision bandwidth across these two datacenters by the time of day. It saves you cost since now you don't have to purchase maximum-capacity appliances for both locations.

3 Enable Shorter Refresh Cycles

Driven by "always changing" security, performance, and hence the infrastructure requirements, refresh cycles have reduced from a traditional 5 years to around 2–3 years. As a result, customers looking to stay current incur a huge cost. With NetScaler TriScale[2] technology, you can keep porting your existing software to new appliances. What that means is, as and when the refresh cycle comes, you can carry forward your license capacity and transfer to the new appliances. You don't have to purchase the capacity again. This helps reduce cost of refresh and allows for a much more cost-effective environment.

4 Increase Scalability of Existing Infrastructure

Performance and scalability requirements change. In most cases, it warrants costly forklift upgrades to the current ADC infrastructure. NetScaler with TriScale[2] technology, allows an appliance to grow five times with just an update of the license file. This pay-as-you-grow model allows for a much more flexible and cost effective environment for the customer.

Buy Only What You Need.
Elasticity with Pay-As-You-Grow

In addition to this, IT managers can scale out their application infrastructure by clustering as few as two and as many as 32 physical or virtual NetScaler appliances. Overall capacity can be increased incrementally—one appliance at a time—from a few Mbps to more than 3 Tbps, all without discarding existing infrastructure investment.

### 5 Consolidate Existing ADC Infrastructure

NetScaler SDX is a multi-tenant appliance that features an advanced virtualized architecture that brings simplicity and consolidation to the network by supporting multiple NetScaler instances on a single hardware appliance. Key strengths and differentiators include:

a. High consolidation density: Up to 115 NetScaler instances can run on a single NetScaler SDX appliance.

b. Full isolation of ADC resources: All critical system resources, including memory, CPU, and SSL processing capacity, are assigned to individual NetScaler instances. This guarantees better performance SLAs, complete isolation of traffic for compliance and security mandates, and independent version control and policy management.

c. Simple scalability and management: With integral support for pay-as-you-grow licensing, individual NetScaler instances can scale up to 24 Gbps on demand. In addition, all instances can be managed and monitored centrally through a single control plane.

Start Small. Grow forever.
Expandability with Add-and-Go
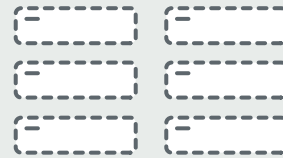
End appliance sprawl.
Simplicity with many in one
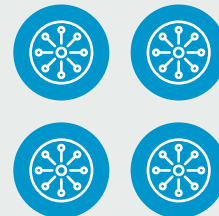
Conclusion

Citrix TriScale[2] Technology accelerates the transformation from traditional computing infrastructure to hybrid cloud networks by making NetScaler the first and only application delivery solution to natively meet the full scope of scalability requirements for today's most demanding datacenters. With TriScale[2]'s complementary capabilities, enterprises can scale up, scale out, scale in, and scale across their application delivery infrastructure to quickly and cost-effectively respond to incremental changes in application demand, transient bursts of activity, the need to support additional tenants, and even business-level events that drive the need for major increases in capacity. In comparison, architectural limitations typical of rigid, hardware-centric, and chassis-based solutions make it practically impossible for competing offerings to achieve a similar breadth and depth of on demand scalability. The net result is that TriScale[2] Technology not only represents an order-of-magnitude advance in application delivery technology, but also provides real value for enterprise customers in the form of an unprecedented — and in many cases unmatchable — ability to:

- Leverage the network as a resource that enhances (rather than impedes) IT agility and responsiveness to changing conditions

- Substantially reduce TCO by eliminating unused and under-utilized application delivery resources

- Build enterprise cloud networks while also establishing the foundation for next-generation service delivery fabrics

Citrix NetScaler is the only ADC that enables true Multi-Dimensional ADC Scaling for the cost efficiency and flexibility your organization needs to thrive in the digital transformation era.

To learn more, visit
www.citrix.com/products/netscaler-adc

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