

# Scale-to-Fit Storage

Accelerate Applications, Protect Data, and  
Empower IT with Nimble Storage

This paper explains how Nimble Storage solutions cost-effectively scale to customers' specific capacity and performance requirements. Customers can non-disruptively and independently scale capacity, cache, or compute; or combine multiple arrays in a scale-out storage cluster.

Matching storage infrastructure to application requirements is an ongoing challenge. Data inevitably grows and new applications are launched. What can IT do when Microsoft Exchange users ask for larger email boxes or virtual desktop users complain about slow response?

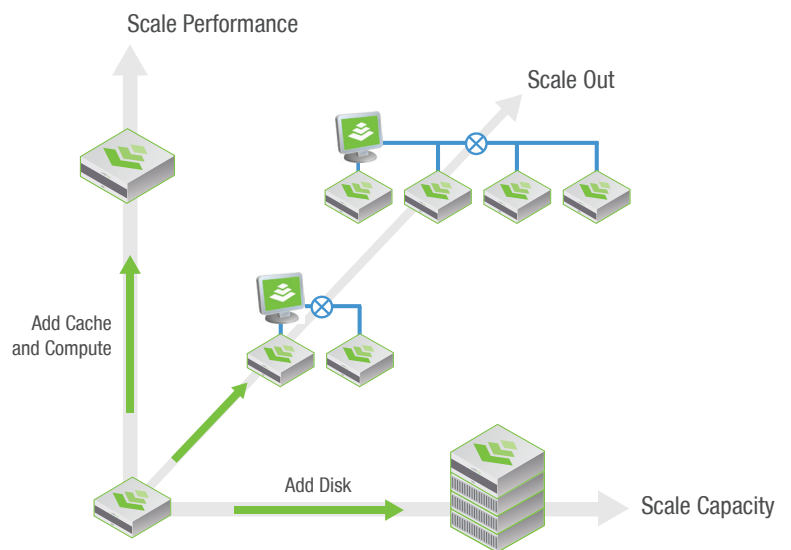
With traditional storage solutions, IT often must choose between maximizing capacity or optimizing for performance. As needs change, it can be disruptive and expensive to scale capacity and/or performance. In many cases, the only options are either to embark on a forklift upgrade to a higher-capacity, higher-performance storage solution, or to deploy a separate storage silo for a given application or data set. In some cases, it may be possible to expand an existing array but it isn't cost effective to do so because the vendor charges additional licensing fees for increasing the storage capacity.

In contrast, Nimble Storage's scale-to-fit design enables customers to buy exactly what they need, when they need it. With Nimble, customers can scale storage capacity, performance, or both, affordably and non-disruptively, with no down time. There's no need to rip and replace anything, no complex silos to manage—just a seamless growth path that fully protects a customer's existing investment and makes it easy to address changing storage requirements.

## Scale Capacity

Scaling storage capacity in a Nimble Storage array is as easy as adding external disk shelves. Each shelf includes disk drives and an SSD for cost-effective storage delivering high throughput. IT can extend a Nimble Storage array, from the CS220 up, with multiple external disk shelves, mixing and matching different capacity shelves as needs require.

Whether to support growing SharePoint workloads, or larger Exchange mailboxes, or to store months worth of snapshot-based backups, Nimble Storage customers can add disk shelves non-disruptively. In addition, IT can manage the entire Nimble Storage array, including the added capacity, from a single console using Nimble's intuitive management console.



## Scale Up Performance

Storage has a big impact on application performance. If storage performance is suffering, it can degrade the response times of database queries, virtual desktop infrastructure (VDI), and other demanding applications. Scaling storage performance requires boosting the number of I/O operations per second (IOPS) that the system can perform while keeping read and write latencies low.

Nimble Storage arrays offer far more performance than traditional solutions with the use of dynamic caching and a write optimized data layout. Customers have two ways to further accelerate their array's performance. The first way is by increasing or upgrading the array's compute power and the second way is to increase the amount of cache.

IT can increase compute power easily by upgrading a CS-Series array with a more powerful storage controller. This additional processing can be used to scale the performance of existing workloads or to accommodate new workloads. In addition, IT can boost storage performance by upgrading the amount of flash on the array using higher capacity SSDs. Increasing the cache allows larger amounts of active data to be served up immediately, boosting end user response times. Both controller and SSD upgrades can be done non-disruptively.

**Figure 1:** Scale-to-fit by scaling up performance, capacity, and scaling out.

## Scale Out for Seamless Growth

Nimble Storage also makes it easy to grow beyond the limits of a single array with its scale-out storage cluster. Multiple Nimble Storage arrays can be combined into a single clustered storage system that can be managed as a single entity. IT can mix and match Nimble Storage arrays—for example, CS200 with CS400 series—in one cluster for complete flexibility and investment protection. And IT can non-disruptively add or remove a new array, disk shelf or other cluster component, so there's never any down time.

Nimble Storage clusters linearly scale storage capacity, performance, and network throughput together as additional arrays are added. As a result, they are ideal for customers who need to expand storage capacity and performance to accommodate new applications, such as VDI, and also need to support existing applications, such as SQL Server or Exchange, as they grow. IT benefits from the ability to scale their storage infrastructure cost-effectively and to carve out storage pools, eliminating poorly utilized storage silos.

Nimble's scale-out clusters feature:

### Dynamic Storage Pools

A Nimble Storage cluster can be logically divided into pools of storage. Individual arrays are the building blocks of storage pools; that is, a pool consists of one or more arrays across which data is striped. IT can migrate volumes between different pools in a cluster non-disruptively. This eliminates down time for users when maintenance or other management tasks require an array be taken offline.

IT can easily expand, shrink or merge pools. For example, if a new array is added to a cluster, it can either be set up as a separate pool or used to seamlessly expand an existing pool. Nimble Storage automatically rebalances data across pools as they grow or shrink, maximizing the utilization of common resources such as network connectivity. Similarly, if IT adds a disk shelf to an array in a cluster, the added capacity will trigger transparent rebalancing across the newly expanded pool with no disruption to applications or users.

### Simplified Management

All of the Nimble Storage infrastructure, including scale-out clusters, can be managed from the Nimble management console. With its intuitive interface, templates and automation, IT can perform all tasks for a scale-out cluster from one pane, including: add or remove an array; create and manage individual pools and volumes; get status information; and view capacity and performance reports. In addition, all operational tasks can be done non-disruptively, including adding/removing an array, upgrading a controller, expanding or shrinking a pool, migrating a volume and so on.

Nimble Storage host tools also automatically configure and manage host connections and paths to data—creating a direct parallel access to data on the cluster. This simplifies IT's job and eliminates the overhead of manual connection setup to individual arrays. It also maximizes host performance and reduces latency. With direct parallel access, hosts are automatically configured to direct reads and writes to the correct array, avoiding any forwarding. For this method of access, the hosts run the Nimble Connection Manager for Windows or PSP plug-in for VMware vSphere.

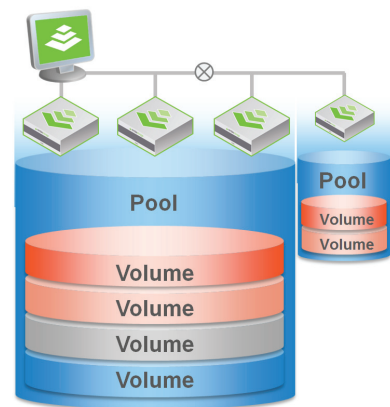


Figure 2: Pools and volumes in a Nimble scale-out storage cluster.

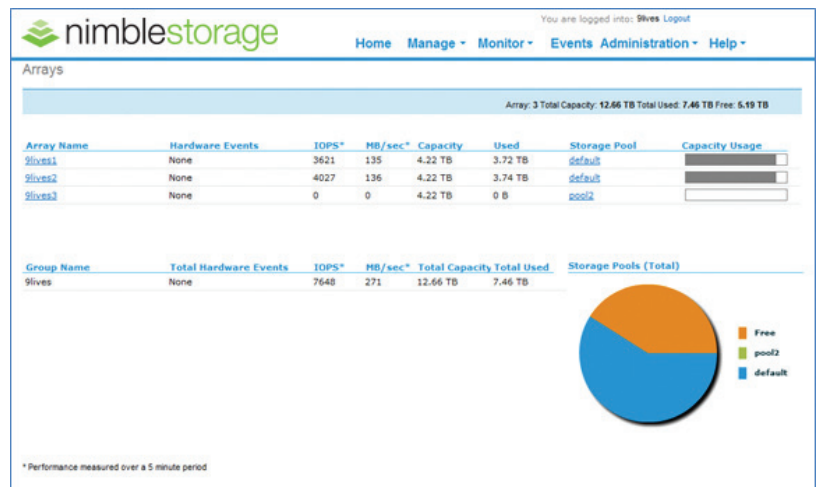


Figure 3: Management UI to manage the scale-out cluster as one.

Nimble Storage clusters also support additional types of host connections, including single-point access and parallel access. Hosts require no change for single-point and parallel access.

### Easy Data Replication

Nimble's scale-out clusters support remote replication of individual volumes, which gives IT granular control over which data to replicate. For example, in a VDI deployment, IT can opt to replicate user data only, since desktops can be easily recreated. Customers benefit from easy, affordable disaster recovery that is ideal for specific applications.

## Putting Scale-Out Clusters to Work

Nimble Storage scale-out storage delivers the flexibility to dynamically change storage capacity and performance as business needs change. Here are common use cases for scale-out clusters:

- Accommodate application growth or new workloads such as VDI or Oracle by adding another Nimble Storage array to an existing scale-out cluster.
- Combine workloads with complementary performance and capacity needs by merging two storage pools into a larger pool. This effectively load balances by leveraging the processing and capacity resources across all arrays in the pool.
- Plan ahead for new workloads or performance growth by migrating volumes from one pool to another pool that has more cache, compute and capacity.
- Remove an array from an existing cluster either for maintenance/upgrades or re-deploy it as needed for other workloads or at a secondary site for disaster recovery.
- Replicate individual volumes from a storage pool in a scale-out cluster at a primary site to either an array or a smaller pool for disaster recovery.

## Nimble Scale-to-Fit Advantages

Nimble Storage's scale-to-fit design gives IT tremendous flexibility to scale storage capacity and performance and to reconfigure their storage infrastructure as needs change. This innovative approach eliminates storage silos and preserves customer investment. It also eliminates planned down time by allowing IT to perform numerous operations non-disruptively, from adding storage shelves and creating/shrinking pools to migrating data. Nimble Storage eliminates storage as a bottleneck and makes it the foundation for handling growth in the datacenter.

## Next Steps

To learn more about Nimble's scale-to-fit storage solutions, please contact a representative at 877-364-6253 or visit [www.nimblestorage.com](http://www.nimblestorage.com).



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