



## Intelligent Management of Performance and Storage Growth

The ever-increasing pressure of managing exponential data growth with limited budgets has long challenged storage and IT administrators. Every data center is tested with managing growing data storage needs. Finding the right way to support storage growth, while still meeting the needs of the business is the task at hand.

There are multiple ways to scale storage, each with its own advantages and drawbacks. Combined with the marketing spin of many vendors and it is not surprising that there is confusion around scale up, scale out and the use case for each. In this document we will examine the different ways to scale storage and consider the strengths of each approach.

When looking to scale storage, users are trying to achieve a particular goal, namely to increase the available capacity in a way that maintains or improves upon the current performance level. There may also be a need to improve availability, as the method chosen may impact the reliability of the entire storage system.

### HIGHLIGHTS

#### Pay As You Grow

- Instantaneous, non-disruptive capacity expansion
- Low-risk entry to high-performance All-Flash Arrays
- Leverage the performance of flash for an individual application, then expand to support mixed, multiple workloads on a single array
- Control CAPEX by aligning expenditures to value as it is received

#### Scale Smart

- Grow both capacity and performance
- Flexibility in capacity expansion
- Share resources and workloads across shelves
- Achieve high-level data protection with stretch cluster support
- Scale up to 1.4 PB raw capacity with 2.2+ Million IOPS

#### Scale Up

Traditional enterprise storage solutions generally consist of two controllers with a number of drives attached to them. As the amount of data to be stored grows, an obvious choice is to simply add more drives, and therefore capacity, to the existing solution. In this approach, commonly referred to as scale up, the additional capacity is placed behind the existing storage controllers without also adding any processing power. As capacity grows over time those controllers reach a saturation point in terms of performance. At this point, the controllers can no longer efficiently support all read/write requests for data, and users are faced with ever increasing response times. Resulting in having the necessary capacity available to meet the growing demand, however, the solution no longer meets the performance needs of the business.

#### Scale Out

To overcome the performance limitations inherent in scale up solutions, an alternative known as scale out has been developed. The definition of scale out and how it is implemented varies greatly depending upon the storage vendor. Nevertheless, the concept is that both capacity and processing power are added simultaneously to meet the growing storage demand. Instead of simply adding drives to existing controllers, two new controllers with drives are added. Generally, the same number of drives that are attached to the existing controllers are added and the storage is then aggregated into a single pool within a cluster.

While this approach does provide both increased capacity and performance, it also has a number of serious drawbacks in terms of both flexibility and reliability.

Remote Synchronous Replication  
 Stretch Clusters  
 Fail Over/Fail Back  
 Data Scaling  
 Multipathing  
 Data Safety  
 Scale Up  
 Mirroring  
 Thin Provisioning  
 Data Efficiency  
 Business Continuance  
 Encryption  
 Clones  
 Snapshots

Common scale out approaches dictate that when capacity is expanded it must match the existing implementation exactly. For example, if a data center has an existing 10 TB solution, the only option is to deploy another 10 TB configuration that is a duplicate of their existing one, even though the vendor might offer the same platform in 20 or 40 TB configurations. As a result, customers cannot deploy the larger configurations, even from the same vendor, to scale their existing storage.

A more serious drawback of the scale out approach is that when the data is added into the cluster, it is striped across the clustered storage. While this may help performance in some circumstances, it exposes the data center to a potentially catastrophic loss of data availability. In the event of the loss of access to any storage enclosure within the cluster, the entire cluster will go down. This is a significant risk to application and data availability that modern data centers and the lines of business that they support cannot tolerate.

## SCALE SMART

The Violin Systems Extreme Performance Storage platforms take a unique approach to scaling capacity. Rather than trying to meet another vendor's definition of what constitutes "scale out", the storage platforms employ multiple methods to deliver simple, instantaneous, and non-disruptive growth for maximum flexibility, performance, and ease of use. We call this Scale Smart.

The first option for Violin customers is the unique Pay-As-You-Grow licensing model. With Pay-As-You-Grow, every Violin storage platform comes fully populated with the maximum capacity that model offers. Violin customers have the option to purchase the platform with certain licensed capacities. As demand increases customers can simply extend the licensed capacity up to the physical limits of the array. Since this additional capacity is already physically in the array, scalability is simple, instantaneous, and completely non-disruptive. Capacity expense can be aligned with its value as it is received.

For scaling beyond a single array, the FSP 7700, supports the addition of any XVS platform, FSP 7000 series, or FSP 6000 series as a storage shelf. Not only does adding shelves increase the total available capacity, it also increases the aggregate throughput and allows the shelves to share workloads. This is in contrast with other vendors' implementations that restrict customers to only adding the exact same configuration. The FSP 7700 supports up to 10 total shelves with scaling capacity to as high as 1.4 PB of total raw capacity within a single namespace.

Further, by adding Violin storage platforms behind the FSP 7700, each can also take advantage of features offered by that platform, such as stretch clustering, which can enable organizations to transparently failover to a disaster recovery site without application disruption. There is no need for customers to settle for disaster recovery when they can have disaster avoidance.

## THE VIOLIN EXTREME PERFORMANCE STORAGE PLATFORM

The benefits of the Violin platforms include lower data center TCO, improved application support, reduced management, and consistent end-user SLAs. CFOs will like Violin for its reduced TCO. CIOs will like it as it frees resources to create new business value. Storage admins will like it as it simplifies data center management. The leader for the all-flash data center is Violin Systems