

ESG Solution Spotlight

Reduxio: Efficient Flash Hybrid Storage with NoDup

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Introduction

While recent price declines in solid-state technology have caused some to hail the advent of an all solid-state future, multiple tiers of storage will likely continue to persist. Providers of spinning media continue to innovate, and among solid-state offerings, multiple tiers of capacity and endurance levels are starting to emerge. Regardless of whether the future will be all solid-state, some form of storage tiering will likely endure. Different workloads will continue to require different priority, performance, and capacity levels with differing tiers of storage capabilities.

The continued demand for multiple tiers of storage is at the heart of the strategy Reduxio, a recent entrant to the storage industry, is rolling out. While a number of current storage architectures were designed with spinning media in mind and integrated solid-state after the fact, Reduxio's flash hybrid architecture based on their TimeOS storage operating system was designed from the ground up for solid-state and to ensure that each tier of storage was used as efficiently as possible.

Analysis

In 2015, ESG conducted a research study investigating general trends within the storage industry, including the impact of solid-state storage.¹ When IT decision makers at organizations currently using solid-state storage were asked to identify the benefits their organizations have realized from the technology, not surprisingly, the top response was improved application performance (57%). What may be surprising, however, were the following responses that rounded out the top four: improved resource utilization (51%), reduced operational expenses (45%), and improved total cost of ownership (TCO) (44%). Despite these benefits, however, solid-state is still considered costly. Indeed, the same study revealed increased storage environment cost to be the most commonly cited challenge by current solid-state users. This seemingly opposing set of responses illustrates the fact that despite its potential to improve efficiency within the data center, solid-state storage is still perceived as demanding a price premium. This is just one reason that hybrid storage solutions exist.

The Reduxio HX 550 Flash Hybrid Storage System

Reduxio's recently announced HX 550 flash hybrid storage array targets the already crowded and highly competitive segment of hybrid storage. Reduxio endeavors to differentiate itself with architecture efficiency. Existing hybrid storage offerings typically fall into one of two categories: existing storage provider solutions that have recently integrated solid-state into architectures originally designed for spinning media, or newly released hybrid solutions that leverage solid-state storage only as a means to accelerate spinning disk media.

Reduxio's core belief is that these existing solution sets harbor architectural inefficiencies. Traditional arrays often layer data reduction capabilities and data migration across storage tiers only as post-process add-ons. Other hybrid arrays, on the other hand, often only leverage solid-state as a cache, limiting the effective capacity and increasing the effective price

¹ Source: ESG Research Study, *2015 General Storage Trends Survey*, conducted in May 2015.



of the storage solution. Reduxio's solution utilizes automatic and continuous data movement across storage tiers to offer up the combined capacity of solid-state and spinning media as usable capacity. While still a new company, Reduxio is introducing a number of features that offer differentiation in an already competitive industry space, including:

- **NoDup Data Reduction:** Instead of applying deduplication and compression post-process, Reduxio's data reduction technology is always on and inline. The data reduction operation is applied as soon as the write comes off the wire, so no duplicate data is stored on DRAM, solid-state, or hard-drive storage. The architecture is designed to be capacity-optimized whether the data is stored as a primary copy or as a clone.
- **Single Copy VMs:** As an extension of Reduxio's NoDup technology, the DRAM cache is data-reduction-aware and designed to understand that even if the same block is read multiple times, only one copy of that particular block shall remain in cache. Cache is an expensive storage resource and Reduxio's technology seeks to maximize its use. This capability is especially applicable in virtual machine (VM) environments, which allows, according to Reduxio, hundreds of VMs to be served directly out of cache.
- **Tier-X Data Tiering:** Data movement can be a performance-impacting endeavor. Reduxio's Tier-X data migration technology seeks to optimize data placement, ensuring that data is continuously and efficiently applied to the right tier of storage. In part, this effort is aided by the NoDup data reduction. Reduxio's data migration technology, however, is also optimized for each type of storage tier, adjusting both read and write patterns to achieve greater performance when data is moved between DRAM, SSD, and spinning media. Additionally, the tiered model allows for more storage capacity to serve data, increasing the capacity available per dollar spent.
- **BackDating:** While snapshots have been a staple of the storage industry for some time, Reduxio takes the concept of point-in-time copies further. Instead of having a limited number of point-in-time references, Reduxio offers BackDating, which may be the enterprise storage equivalent of the DVR rewind feature for your data. BackDating allows administrators to clone or revert any storage volume to any point in time in the history of the system at the granularity of 1 second. This capability is automatic and consistent systemwide with no need for consistency groups. BackDating also does not require upfront configuration and is designed to be used for both data recovery and application testing purposes.

The Bigger Truth

In some cases, being later to market may be more beneficial than being first. Providers can learn from the successes and failures of the past. New technologies may be better understood and more mature, allowing the right blend of capability, usability, performance, and price to come together. The hybrid storage arena is an already competitive and highly populated battleground. Reduxio will still have to prove itself like all new technology firms, but this initial volley of innovations does much to help separate Reduxio and its flash hybrid array from the pack.

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