



Storage Data-Efficiency Technology Saves Energy and Cost in the Enterprise Data Center

Testing by Prowess Consulting demonstrates that the Dell™ PowerStore™ 1200T can help enterprises use fewer drives to store the same dataset and reduce drive energy use by up to 41 percent.¹

Executive Summary

Manufacturers of all-flash storage platforms have responded to customer needs for lower price points by applying data-efficiency technologies. They use data services such as compression and deduplication to help reduce the amount of physical storage that is needed to save a given dataset. Although these approaches have been used for years, increasing storage efficiency to lower costs is even more critical in today's uncertain business environment.

Reducing the required storage space lets organizations deploy fewer drives, which leads to a reduction in power and cooling needs. It also reduces the physical footprint of the solution, which can lead to floor space and rack savings. These combined benefits can help lower the total cost of ownership (TCO) of storage and help enterprises meet their sustainability goals.

To explore options for IT organizations, Prowess Consulting tested two NVM Express® (NVMe®) all-flash platforms and measured both storage and energy efficiency. We tested the Dell™ PowerStore™ 1200T and a second, similar storage platform from Vendor A.² Both storage platforms guarantee a data reduction ratio (DRR) of 4:1 for block workloads.^{3,4}

We observed that the PowerStore 1200T demonstrated a significantly higher DRR of 4.8:1, compared to the Vendor A storage platform, which measured a DRR of 2.8:1.¹ The PowerStore 1200T uses fewer drives for the same dataset, resulting in up to 41 percent less energy used. Finally, we found that the Dell Technologies product was more intuitive and easier to use compared to the Vendor A product. The superior data reduction capacity, combined with one-drive scaling ability, contributes to a lower overall TCO. Our research findings are summarized below:¹

4.8:1
DRR

41%
less
energy

Intuitive,
easy
to use

One-drive
scaling

Lower
overall
TCO

Ease of Use

We observed that the PowerStore 1200T user interface (UI) was more intuitive and easier to use than the Vendor A platform UI. For example, the PowerStore 1200T offers a single page for volume management, whereas the Vendor A platform requires the user to switch back and forth between two pages. We also found that information like storage utilization was not as clear on the Vendor A platform.

Test Results

Prowess Consulting used Vdbench, an industry-standard storage benchmarking tool, to simulate a dataset with a 2:1 compression ratio and a 2:1 deduplication ratio. Using this dataset, the PowerStore 1200T demonstrated a DRR of 4.8:1, whereas the Vendor A storage platform demonstrated a DRR of 2.8:1 (see Figure 1).¹ The PowerStore 1200T exceeded the 4:1 guarantee, while the Vendor A platform did not meet the guarantee.

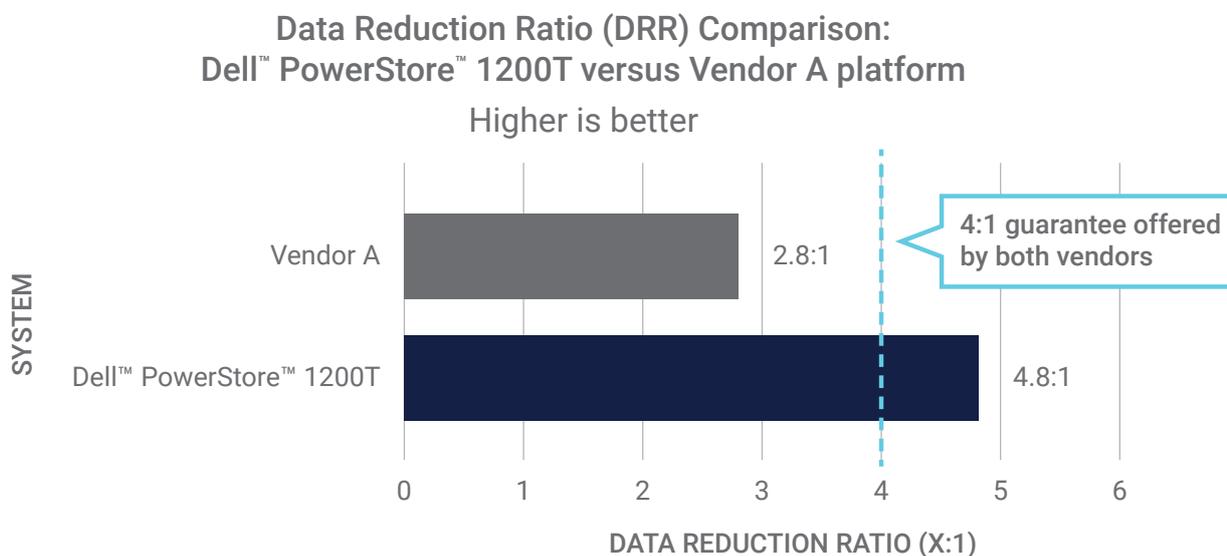


Figure 1 | DRR comparison¹

Doing More with Less

We also computed how many fewer drives would be needed in the PowerStore 1200T to store the same amount of application data as in the Vendor A platform. Our calculations revealed that, given each platform’s DRR, the PowerStore 1200T would need just 14 drives to store the same dataset for which the Vendor A platform requires 24 drives. (See the Prowess Consulting technical research report, [“Do More with Less in the Enterprise,”](#) for detailed calculations.)

As sustainability is becoming a key strategy for businesses, data reduction technologies are becoming even more important. These technologies can help reduce the amount of physical data storage space required, thus reducing the amount of power and cooling used. We examined energy savings as part of our research.

Platform Comparisons

In the scenario we used for our testing, the PowerStore 1200T drives used 200 fewer watts, or 41 percent less energy than the Vendor A drives (see Figure 2). As fewer drives are used, we anticipate that less rack space and less cooling would be needed.

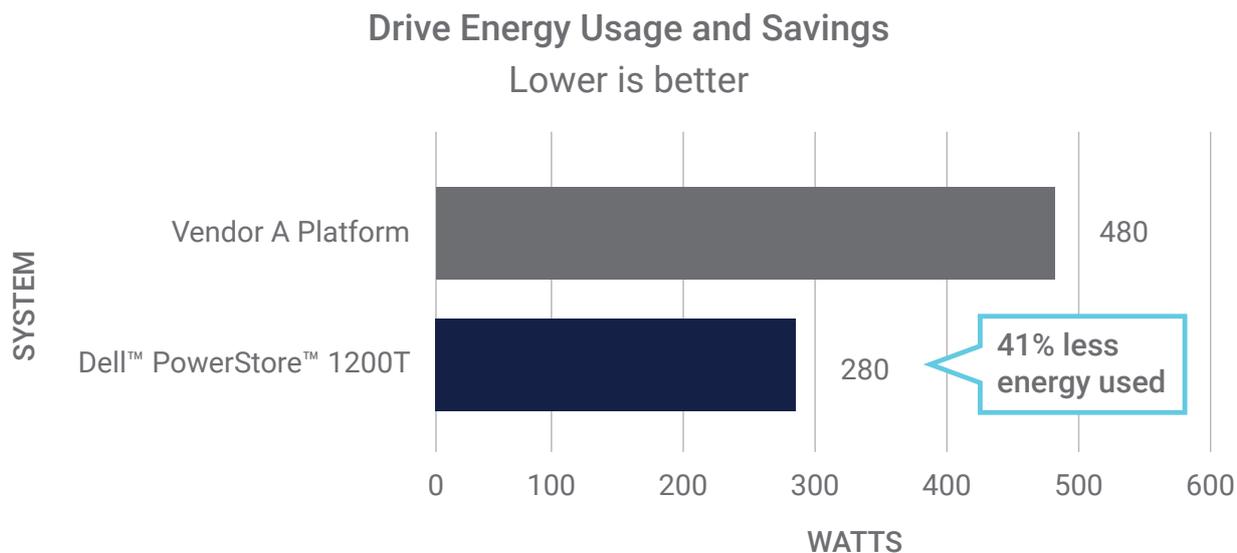


Figure 2 | Drive energy used by drives (in watts)¹

These savings are linear with dataset scale. As datasets grow and more drives are added, the PowerStore 1200T offers significant power consumption savings. At a usable capacity of 128 TiB, for example, the PowerStore 1200T saves 800 watts as compared to the Vendor A platform.¹

Scalability

The PowerStore 1200T is highly scalable with flexibility, whereas the Vendor A platform is not. For example, the PowerStore 1200T system offers the ability to scale storage capacity in increments as small as one drive. An enterprise can add two, three, or four drives without worrying about expanding with a bundle of drives that results in overprovisioning of storage. This allows enterprises to purchase only the amount of storage needed for a given workload, which can help minimize storage costs. Given its lower DRR, single-drive scaling is an area of opportunity for Vendor A.

Reduced Total Cost of Ownership (TCO)

Because fewer PowerStore 1200T drives are needed to provide the same effective capacity as compared to the Vendor A platform, enterprises can reduce total hardware and software infrastructure costs. This helps to reduce overall TCO.

Learn More

For complete testing details, read the Prowess Consulting technical research report, "[Do More with Less in the Enterprise.](#)"

¹ Prowess Consulting. "Do More with Less in the Enterprise." June 2023. www.prowessconsulting.com/project/230083-dell-powerstore-validation-save-energy-technical-research-report.

² Prowess Consulting did not have permission to use the commercial name of Vendor A for this paper.

³ Dell Technologies. "Dell Technologies All-Flash Data Reduction Guarantee Terms and Conditions." May 2022. www.delltechnologies.com/asset/en-us/products/storage/legal-pricing/future-proof-dr-guarantee-tc.pdf. Storage Data Reduction Guarantees: Requires customer signature and purchase of ProSupport Plus or ProSupport with Mission Critical. Applicable products include [All-Flash Storage products only](#).

⁴ Vendor A 4:1 DRR guarantee for NVMe, 2023.



The analysis in this document was done by Prowess Consulting and commissioned by Dell Technologies. Results have been simulated and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance. Prowess Consulting and the Prowess logo are trademarks of Prowess Consulting, LLC. Copyright © 2023 Prowess Consulting, LLC. All rights reserved. Other trademarks are the property of their respective owners.