



Increase Performance, Improve Reliability, and Reduce Costs

Redefine your storage solutions with VAST Data and all-flash Intel® technologies

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Rapid data growth is driving demand for new enterprise storage solutions

The volume of data that enterprise organizations must manage is expanding at an unprecedented rate. In November 2019, 84 percent of enterprises surveyed by 451 Research reported a rise in the amount of data they need to store compared with previous years, and 30 percent said they already store more than 250 petabytes (PB) annually.¹

The rapid growth of data is straining traditional storage infrastructure. Performance suffers because of the corresponding increase in hard-drive latency and tiered-storage complexity. Lack of storage-appliance redundancy threatens reliability by creating gaps in access and introducing a single point of failure. And because the existing infrastructure lacks flexibility and interoperability, it can't scale affordably and efficiently to meet rapidly changing storage requirements.

Enterprises can no longer rely on traditional tiered storage solutions to store and process the huge volumes of data they have to manage. Modern enterprise storage solutions must provide high-level performance that massive real-time applications and ever-growing workloads demand. As datasets continue to expand, storage clusters must expand with them, providing high scalability while also delivering greater reliability, easier management, and lower costs than traditional storage options. To meet today's business challenges, enterprises must redefine their traditional approaches and embrace next-generation storage solutions.

VAST Data offers a new approach to storage

VAST Data designed a new storage cluster solution from the ground up to address these evolving enterprise storage needs. The company's Universal Storage architecture replaces conventional data center storage tiers with a single, unified pool of Intel® Optane™ Solid State Drives (SSDs) and Intel® Quad Level Cell (QLC) 3D NAND SSDs. This innovative approach delivers the performance enterprises expect from costly all-flash storage approaches, but at a price that rivals conventional hard-disk solutions.

By building on the benefits of Intel Optane SSDs and Intel QLC NAND SSDs, VAST Data built a new breed of enterprise storage that delivers all-flash performance; a simplified design approach with new levels of reliability and efficiency; and high scalability fit to PB-class applications—all for less capital investment and ongoing operational cost than has been possible with all-flash storage solutions.

VAST Data also created a new set of algorithms to address many of the challenges inherent in tiered storage by maximizing Intel® storage drive technologies. VAST optimizes Intel QLC SSDs by intelligently performing similarity-based data reduction on Intel Optane SSDs, then writing that data to the QLC media in a way

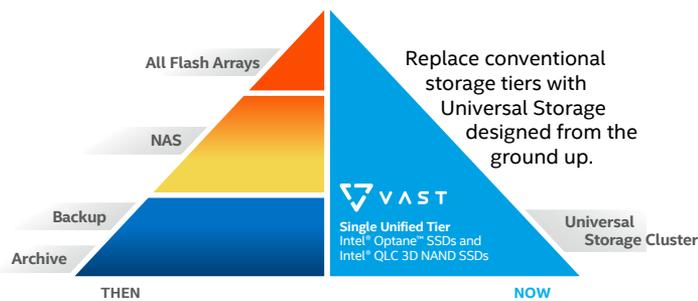


Figure 1: VAST Data is built on a unified pool of Intel® Optane™ Solid State Drives and Intel® QLC 3D NAND SSDs to eliminate the complexity of traditional storage architectures.

that maximizes the endurance of the QLC. In effect, this improves customers' usable storage capacity with higher reliability, resulting in less required maintenance and overall lower overall system cost. The system is so effective that VAST offers a 10-year warranty on its QLC-based systems.²

Business drivers and desired outcomes

- **Increase performance.** By replacing HDD or hybrid storage media with Intel Optane SSDs and Intel quad-level cell (QLC) 3D NAND SSDs, VAST Data achieves all-flash levels of performance, which you can magnify even further with VAST Data's algorithms and advanced architecture.
- **Reduce costs.** VAST's Universal Storage solution helps lower costs through innovative technologies such as low overhead data protection and very efficient data reduction combined with the per-terabyte savings of Intel QLC SSDs.
- **Improve reliability.** VAST's Flash translation layer uses high-endurance Intel Optane SSDs to absorb all of the data processing load and spares the QLC drives from excess wear, thus extending the QLC media reliability.
- **Simplify design.** VAST's Universal Storage is designed with stateless Protocol Servers that operate independently but access a shared, global namespace. This simplified design eliminates inter-cluster communication overhead and provides essentially unlimited scaling.

Accelerate AI training time by simplifying storage tiers

One VAST Data case study illustrated how scale-out Universal Storage made a massive difference in one client's GPU server cluster, keeping processors supplied with a much fuller data pipeline, with far greater cost-performance, than without it.

Traditional solutions tried by the client included a simple design based on NAS infrastructure. It faced limitations in performance and scalability, achieving approximately 2 GB/s throughput. Next, they tried introducing expensive SSDs as part of the cache file system. While this approach delivered 5 GB/s per processor server mount, it was complex to implement and maintain.

The client then transitioned to VAST's Universal Storage solution, based on VAST storage servers loaded with Intel Optane Solid State Drives (SSDs) and Intel quad-level cell (QLC) 3D NAND SSDs, connected to processing servers over 100+ Gb Ethernet or InfiniBand networks. The solution delivered far higher performance than traditional storage. Configured for NFS over RDMA, processing servers realized 8 GB/s per mount. With VAST software installed as a local container within the processor server, processing throughput leaped to more than 10 GB/s per mount.³

Enabling transformation

Intel is pioneering technologies to enable data center modernization—a major goal for most enterprises today—and new storage solutions are a key component. With Intel Optane SSDs, companies can modernize at their own pace, and within their individual budget requirements increase the performance of their existing infrastructure, improve reliability, and reduce costs.

Where to get more information

Find the solution that is right for your organization. Contact your Intel representative or visit <https://www.intel.com/content/www/us/en/products/docs/storage/storage-products.html>

- VAST Data white paper
- VAST Data home site
- Intel® Optane™ technology
- Intel® QLC 3D NAND technology



¹ 451 Research, "The Infrastructure Imperative" November 2019. page 8, <https://www.digitalrealty.com/resources/white-papers/the-infrastructure-imperative>

² VAST, <https://vastdata.com/zero-compromise-satisfaction-guarantee/>

³ ST white paper, "Universal Storage for Deep Learning," vastdata.com/wp-content/uploads/2019/06/VAST-Data-AI-Solution-Brief.pdf

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