

High-Performance NVMe™ Storage with No Compromise Drive Failure Protection (DFP) and Extended Drive Life



Highlights

- Pairing Pliops Extreme Data Processor (XDP) PCIe card with Ultrastar® DC SN640 NVMe SSDs delivers up to **3x** storage performance and enhanced efficiency
- Optimizes SSD endurance with up to **6x** increase in useful life for longer hardware refresh cycles
- Up to **6x capacity savings** – including higher usable capacity without performance limitation
- Full performance NVMe RAID 5/6 data protection with up to 3x faster rebuilds
- Up to **70% TCO** reduction benefit
- Ideal for data-intensive, performance-sensitive enterprise application workloads
- The joint solution works with any server – with no changes to the application or special hardware
- A single Pliops XDP supports up to 8 Ultrastar DC SN640 SSDs

Applications

- RDBMS: MySQL®, MariaDB, PostgreSQL®, SQL Server®,...
- NoSQL: MongoDB™, Cassandra®, Redis®,...
- Storage Software: Ceph, Gluster,...
- Analytics: Apache Spark™, Kafka®,...

Benefits

- Proven enterprise-grade NVMe low latency storage
- Higher reliability, efficiency and protection, at scale
- Single solution across applications and use cases
- Simple, flexible deployment; no changes required
- Increased node-level reliability and uptime

Western Digital | Pliops Solution



Figure 1. Pliops Extreme Data Processor (XDP) and Western Digital Ultrastar DC SN640

A single Pliops XDP and up to 8 Ultrastar DC SN640 NVMe SSDs combine seamlessly to deliver a new level of storage efficiency, with RAID 5/6 style data protection, higher performance, and TCO benefits.

Challenges

Two key increasingly critical challenges are creating the need for an updated approach to building scalable, data-protected, high-performance storage infrastructure:

- How to support an increasing number of data-intensive application workloads with the need for consistently high performance
- How to cost-effectively scale high-performance data storage infrastructure while providing data protection with faster drive rebuilds, more useable capacity, and longer useful drive life – especially with higher-capacity SSDs

These challenges have led to the rise of new storage infrastructure requirements for organizations across all industries, especially where data growth volume is significant and data protection is critical.

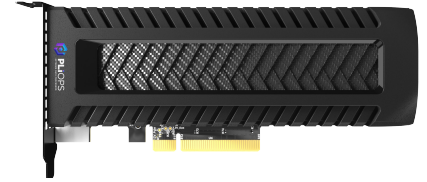
Solution

The need for an affordable and manageable data storage solution that addresses these challenges has never been greater. A single Pliops XDP card seamlessly works with up to 8 Ultrastar DC SN640 NVMe SSDs, managing the data flow between the application and each SSD – enabling new efficiencies and cost savings across a broad set of applications and use cases at scale. The combined solution delivers accelerated performance, optimized drive endurance, greater usable capacity, and built-in no compromise RAID 5/6 style data protection with ultra-fast drive rebuilds.

Pliops Extreme Data Processor (XDP)

Just as GPUs overcome processing inefficiencies to accelerate AI and analytics performance, the Pliops Extreme Data Processor (XDP) overcomes storage inefficiencies to accelerate performance and dramatically lower infrastructure costs. Delivered on a low-profile PCIe card, XDP works with any server to multiply the scalability of workloads and data capacity by delivering ultra-high performance Drive Failure Protection (DFP) and inline compression for data-intensive NVMe SSD-based applications.

Using breakthrough data structures and algorithms, XDP improves how data is processed by managing the dataflow from applications to SSD storage, eliminating bottlenecks and latency that cost time and resources. The result is improved performance, reliability, capacity, and efficiency while freeing the host CPU to focus on other high-priority tasks.



No Compromise Drive Failure Protection for SSDs

Pliops XDP's integrated DFP provides full performance RAID 5/6 style protection up to 3x faster than software RAID 0 with ultra-fast rebuilds (up to 3x quicker than hardware RAID 5) while maintaining consistently high performance with <10% performance drop. In the event of a drive failure, recovery time is short with only minimal impact on applications and drive, server, and storage resources – protecting customer SLAs by maintaining constant data availability with no data loss or downtime.

Optimize SSD Endurance with Capacity Savings

SSD endurance is increasingly important and especially for write-intensive applications. Pliops XDP optimizes SSD endurance by managing the dataflow between applications to SSDs, performing all writes sequentially and in consistent-size chunks. This dramatically reduces write amplification (as low as 1), significantly reducing SSD wear and optimizing endurance for up to 6x longer useful life.

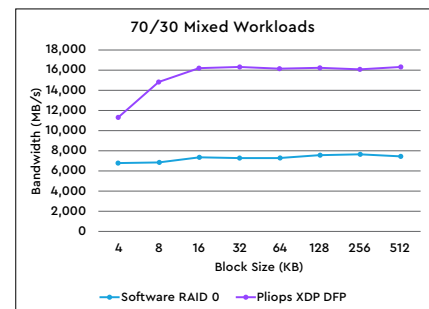
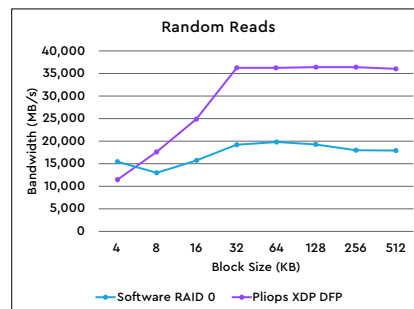
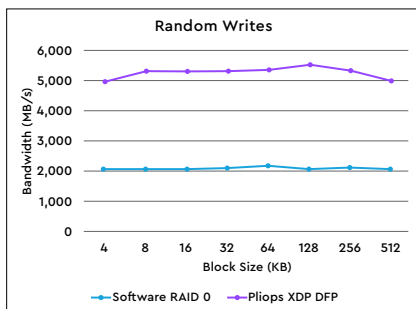
XDP's integrated inline transparent compression and data reduction technology enables near 100% SSD capacity utilization and up to 6x space savings while providing full performance and DFP data protection. Both extended endurance and capacity savings significantly reduce the effective cost/TB for the life of the SSD.

Solution Testing

Solution testing was accomplished with a single Intel® Server System (M50CYP2UR208) configured with 2 x Gold 6346 CPUs (3.1GHz 16 cores each), 256 GiB for memory. 8 x 7.68 TB Ultrastar DC SN640 NVMe SSDs, and a single Pliops XDP card. The testing methodology focused on data performance in various workload scenarios, measuring Read and Write bandwidth (MB/s) for a range of block sizes (KB). A Linux® FIO benchmark tool was used to generate and manage all SSD I/O workloads.

Test Results

Results were baselined by testing the solution configuration using Software RAID 0 without Pliops XDP against the same setup with XDP and DFP enabled. Pliops XDP increased performance by more than 2x for most block sizes while providing much-needed redundancy for the storage array. The following graphs highlight the solution performance benefits.



Learn more about Pliops XDP: <https://pliops.com>

Pliops XDP is listed in the Western Digital compatibility guide. <https://www.westerndigital.com/support/tools/partner-product-compatibility>



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