SOLUTION BRIEF

PLiOPS
EXTREME DATA PROCESSOR

Scaling Data Center Storage To Meet Explosive New Demand

Background

As the world moves online at an increasing pace, data and application workloads continue to grow exponentially. Unfortunately, processor performance isn't.

Computing performance is now forecasted only to double every 20 years, but at the same time, SSDs are getting cheaper, denser, and faster, especially NVMe SSDs. Increasingly, the overall server architecture cannot take full advantage of SSDs, making it more challenging to keep up with growing performance demands.

Today's infrastructure runs up against two inherent bottlenecks:

• CPU limitations due to higher computational loads

• Storage I/O's as a result of high data amplification

Fundamentally, SSDs are improving at a much faster rate than CPUs, which results in inefficient processing and wasted storage. Without a better technology solution, companies have no choice but to deploy more CPUs and SSDs as a performance stopgap that results in ballooning capital and operating expenses.

Ultimately, the answer is not more server and storage hardware. Companies that don't address skyrocketing computational inefficiencies will quickly find themselves falling behind innovative competitors that leverage hardware accelerators to innovate more efficient and scalable solutions.

Rather than expending more resources, companies need to work smarter - specifically by taking advantage of hardware accelerators that can deliver an order of magnitude more efficient infrastructure.

Acceleration using the Pliops Extreme Data Processor turns this potential into reality.

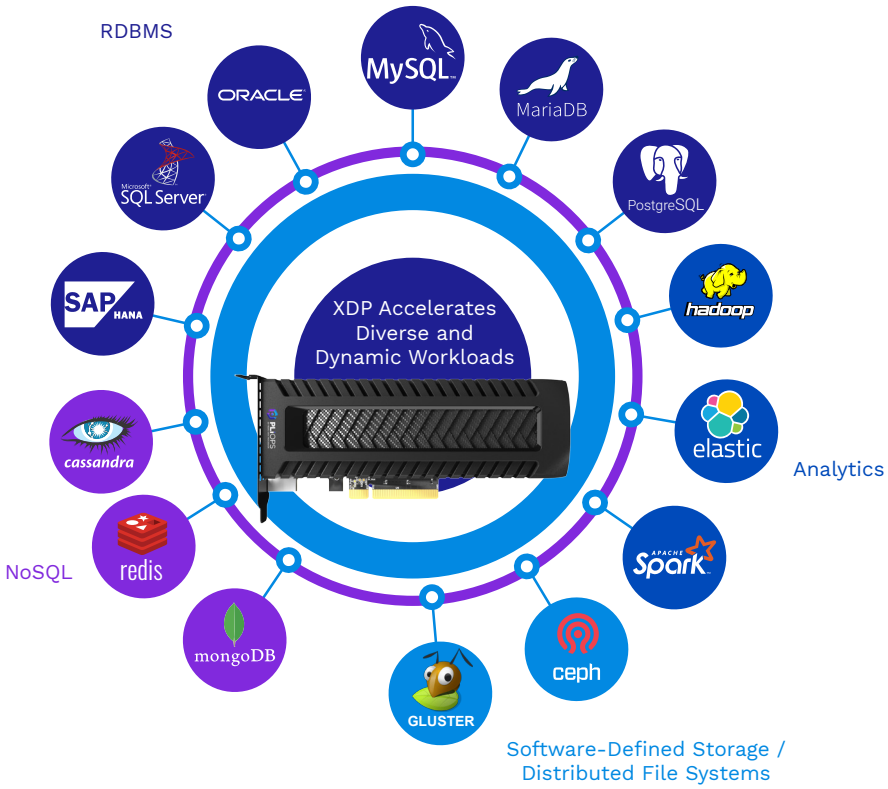
Key Highlights

Pliops XDP allows users to:

- Performance: Enables data centers to access data up to 100x faster with one-tenth of the computational load and power consumption
- Increases throughput of cloud databases such as MySQL and Redis by up to 10x, while cutting the compute load by 80% and network traffic up to 99%
- Reliability: Reduces load latencies by three orders of magnitude and mixed read/write latencies by two orders of magnitude
- Capacity: Provides better storage scalability, longer-lasting NVMe SSDs, and more efficient CPU utilization
- Increases data stored on SSDs by up to 6x through optimal space reduction and higher SSD utilization
- Efficiency: Offloads the computational load required for cloud databases and software-defined storage
- One solution for any workload. Works with any server and any SSD. Easy to deploy in a half-height PCIe card

A New Acceleration Option

Pliops Extreme Data Processor (XDP) is delivered on an easy-to-deploy, low-profile PCIe card that radically simplifies the way data is processed and SSD storage is managed to exponentially increase performance, reliability, capacity, and efficiency—multiplying the effectiveness of your infrastructure investments. Pliops XDP can be implemented using either the current ubiquitous block interface or easily-integrated via an application native key-value interface for even higher performance. XDP accelerates inefficient software functions to optimize management of data persistence and indexing tasks for transactional databases, real-time analytics, edge applications, and software-defined storage (SDS).



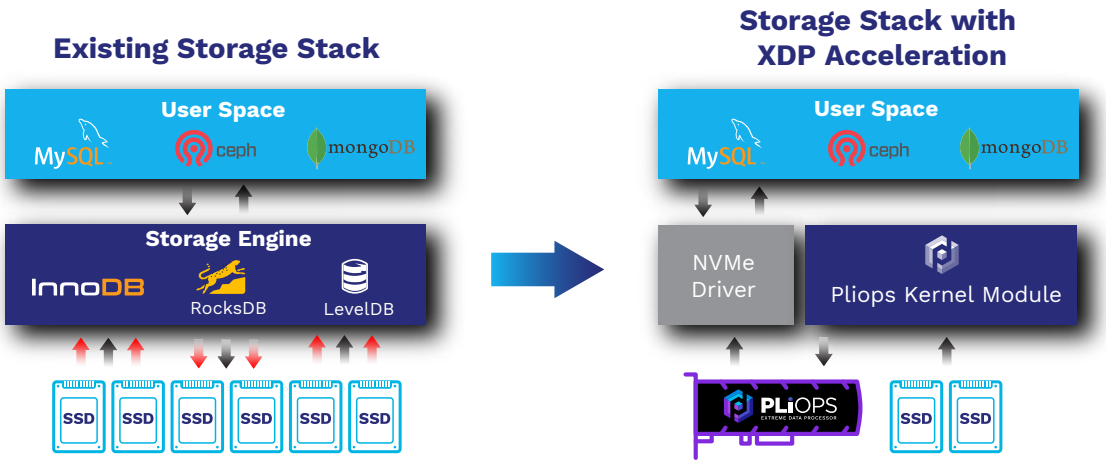
Pliops XDP is a single, broadly applicable solution that can provide high value to the most popular databases and applications through a plug-and-play block interface that requires no modifications or via existing key-value software APIs for optimal efficiency long term. Using the block interface, XDP is compatible with all Linux applications and hypervisors without modification. Each storage processor can support up to 64TB of SSD volumes using virtually any third-party DAS or disaggregated flash storage. Higher capacity is enabled with multiple Pliops cards. The storage processor dramatically increases the number of transactions per second and expands capacity for the most demanding applications.

How Pliops Extreme Data Processor Works

While software-based key-value store operations perform core functions for nearly every database, software-defined storage, and analytics environment, they cause a combination of read, write, and space amplification. For typical database applications, write amplification can grow up to 40x and read amplification to 100x, consuming network bandwidth and hampering SSD performance, latency, and endurance. In addition, these applications generate space amplification in the 2x-7x range, consuming your storage capacity for their inefficient internal, structures. This amplification results in large part from the inherent inefficiency of typical storage blocks being uniform in size, no matter the variability of what they contain. Use cases such as transactional/time-series databases, real-time analytics, IoT/edge, and SDS applications have variable storage sizes smaller than the typical storage block size, and all suffer from the inefficiencies caused by this data amplification.

Pliops XDP uses an innovative data structure enabled by hardware acceleration to increase storage performance without requiring changes to most user application software. By eliminating layers of the database, file, block, and storage management accumulated over decades by legacy architectures, Pliops XDP makes it possible to take full advantage of flash storage.

Instead of a single storage object size, Pliops natively manages objects of different sizes, reaching the theoretical limits of efficiency. The Pliops Extreme Data Processor efficiently packs and manages those objects and continuously maps them to standard SSD blocks to provide significantly better efficiency than with a software solution.



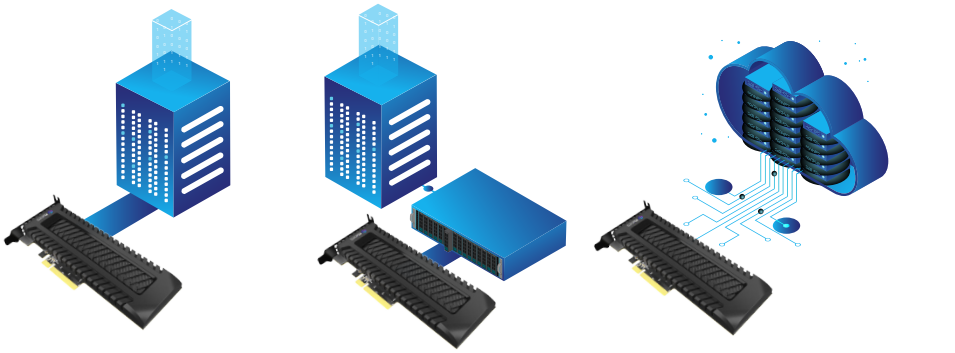
Deployment Flexibility

Pliops XDP can be added to a server with direct attached storage or a storage server, to a single or multiple NVMe-oF storage systems or as a service for cloud hosting providers.

COMPUTE
Compute Node Acceleration

STORAGE
Storage Node Acceleration

CLOUD SERVICE
Pliops-as-a-Cloud Service



PLiOPS
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A New Model Powering Business Potential

Pliops XDP eliminates the CPU and IOPs bottlenecks that can cost you time, resources, and most importantly, business opportunities. With Pliops, you have a highly optimized, reliable, and scalable storage system that can deliver 10x faster performance and 100x improved response time with far less storage. You also have the added advantage that the easy implementation afforded by the standard block interface option requires no changes to your existing software or infrastructure design.

90% Reduction in Write Amplification
66% Reduction in Read Amplification
6x Increase Data on SSDs
93% Reduction in Query Latency
10x Higher Queries per Second

The result is greater scalability and lower CapEx and OpEx to meet your P&L goals. You'll be able to stay agile and competitive in an increasingly unpredictable environment. While even the largest cloud providers are struggling to scale to meet the huge new demands of the challenging world environment, Pliops offers a solution that helps cloud providers of all sizes deliver the most efficient and scalable infrastructure and services.

Businesses must constantly scale to support new peak workloads while managing CapEx and OpEx. Pliops offers the most efficient approach that delivers immediate and substantial business value. This affordable, easily deployable solution will eliminate slowdowns and radically reduce hardware costs so that you can put your full infrastructure investment to the best use. Pliops is ready to help you meet your new challenges in a rapidly changing and increasingly online world.

Pliops Delivers Breakthrough Levels Of **Consistent, Highly Scalable Performance** To Address The Realities Of An **Increasingly Dynamic**, Online World.

About Pliops

Pliops multiplies the effectiveness of organizations' infrastructure investments by exponentially increasing data center performance, reliability, capacity, and efficiency. Founded in 2017 and named as one of the 10 hottest semiconductor startups by CRN in 2020 and 2021. Pliops global investors include NVIDIA, Intel Capital, SoftBank, Western Digital, KDT, and Xilinx. **Learn more at www.pliops.com**.