



KALRAY K200-LP™ STORAGE CONTROLLER CARD

Performance-optimized Disaggregated NVMe

- Use NVMe SSDs in a disaggregated solution with the same performance as local NVMe or direct attached
- NVMe-oF pass-through mode or Logical Volume Management (LVM) mode
- Enterprise storage data services offloaded from the host to the array
- Maximize NVMe SSD utilization

Powered by Kalray MPPA® DPU

- New generation of fully programmable data-centric processors. Runs all critical storage functions on one single chip in a disaggregated storage appliance
- Create custom data processing functions or Computational Storage Functions (CSFs)

Best Performance per Watt and per \$

- 15x Better IOPS/\$ over x86-based solutions
- 3 to 5 times better IOP/W

Build your own NVMe-oF All-Flash Array and Enable Storage Disaggregation

Most NVMe flash is deployed local storage (in-server) or direct attached, which does not scale and can leave capacity resources stranded and performance bottlenecked. **Kalray's K200-LP™ Storage Target Controller card** is a turn-key scalable solution to build the next generation of high-performance advanced storage systems. It enables the rapid deployment of a cost-effective, high performance NVMe-oF All-Flash Array.

Traditional storage controllers cannot handle modern NVMe device performance and become bottlenecks when deploying NVMe in legacy storage arrays. Additionally, there is significant cost, performance, and power penalties when executing data services such as compression, encryption, or erasure coding on x86 based arrays.

Thanks to the Kalray fully programmable **MPPA® DPU (Data Processing Unit)**, the need for x86 CPUs and associated bottle necks is eliminated. K200-LP™ has been fully optimized to address the growing market of NVMe and NVMe-oF -based storage solutions, from Cloud to Edge. It is a game changing solution in terms of performance per Watt and per dollar.

The Storage Target Controller (STC) offers a wide variety of standard enterprise data services including RAID, multipathing, thin provisioning, cloning and snapshots. The STC is fully programmable with Kalray's Access Core Storage (ACS) SDK to develop custom data processing applications.

Build your own NVMe All-Flash Array appliance and address the key challenges of scale-out NVMe storage: scalability, performance, cost-efficiency, and ease of use.

UNLEASH THE FULL POTENTIAL OF NVMe SSDs

Powered by MPPA® DPU

A new generation of powerful data-centric processors delivering an unprecedented level of performance & programmability.

Coolidge™ is the third generation of Kalray's MPPA® ("Massively Parallel Processor Array") Intelligent Data Processors. Coolidge™ is natively capable of managing multiple workloads in parallel with no bottlenecks to enable smarter, more efficient, and energy-wise data-intensive applications.

This is significantly more cost-efficient, and gives much higher performance, than x86 based architectures, which will see reduced performance efficiency due to data processing bottleneck when adding data processing services.

MPPA® DPU Key Benefits:

- Heterogeneous multi-processing
- Fully programmable data-centric
- Modular SPDK-based software environment
- Security (secure islands, encrypt/decrypt, secure boot)
- Hardware acceleration of key functions
- Storage data processing acceleration
- Power efficient
- High-speed interfaces
- High performance

AccessCore® Storage SDK

AccessCore® Storage (ACS) is an SPDK-based open software environment targeting storage applications and storage data services such as encryption, erasure coding, deduplication, or others. ACS provides standard APIs and tool chains along with MPPA® DPU-optimized network and storage software stacks.

Example of Use Cases

▪ Feed Data-hungry GPUs for AI and Machine Learning

Build a disaggregated NVMe storage array for AI, Machine Learning and Deep Learning workloads that has been designed from the ground up to leverage the full potential of NVMe flash devices at massive scale. Enable data scientists to unlock the performance of NVMe SSDs at scale and feed their data-hungry GPU's.

▪ Boost Parallel File System Performance for High Performance Computing

HPC infrastructures significantly increase productivity for research organizations but also require higher performance networking and storage. The Storage Target Controller integrates with all popular parallel file systems and guarantees the highest performance per \$ and Watt.

TECHNICAL SPECIFICATIONS

Features	K200-LP™ Specifications
Ethernet Speed	2x100GbE – 2xQSFP28 (Fiber or Copper) supports multiple bifurcations
Power Consumption	30W (Avg)
Interface	x16 PCIe Gen4 (or 2x8, 4x4, 8x2)
Memory	2x DDR4 4GB @ 3200MT/s with ECC (up to 32GB per card)
Card Format	Low Profile - Half Length
Processor	MPPA®3-80 (Coolidge™) 80 cores @up to 1.2 GHz
Overall Size	167.65 mm x 68.9 mm
Power Input	Only PCIe gold finger connector power input (75W: 3.3V @ 3A + 12V @ 5.5A)
Width	1 Standard PCIe Slot
PCB Thickness	1.6 mm

PERFORMANCES

Features	Per K200-LP™ Card
Random R/W	Up to 2 MIOPS
Sequential R/W	Up to 12 GB/sec
Latency	20-50 usec
Number of Initiators	Up to 24
Number of SSDs	Up to 64

K200-LP™
Target Controller Card

2 MIOPS
High Performance

30µs
Low Latency

2x100 GbE
Per card, PCIe Gen4,
DDR4 @3200Mhz

30 Watt
Power Consumption
per Card

contact@kalrayinc.com
kalrayinc.com

 **KALRAY**
THE POWER OF MORE