## All-SSD, High-Performance and Cluster-Wide Deduplication at Massive Scale

10X More IOPS (@75% Read, 8K, 100% Random) & 3X More IOPS (@100% Read, 8K 100% Random) With iSCSI vs. Hybrid Configurations

Micron and Nexenta have formed a strategic collaboration, delivering all-SSD, block storage solutions — freeing IT from the scale and performance limitations of legacy designs. By leveraging the engineering expertise of both companies across high-performance enterprise SSDs, advanced DRAM and Nexenta® NexentaEdge™ scale-out block and object software-defined storage, Micron and Nexenta have enabled next-generation, all-flash block storage running on standard platforms powered by Micron M510DC enterprise SSDs and advanced DRAM. This compact, 5U cluster is designed specifically for OpenStack® clouds, active archives, container and big data infrastructure.

This all-SSD solution (collaboratively developed by Micron, Nexenta and Supermicro) is optimized for faster results and better value versus legacy solutions. It provides predictably high performance and value that makes it easy to deploy and manage.
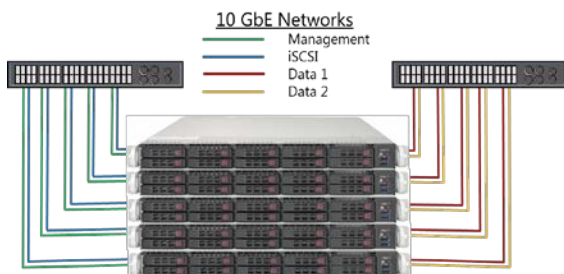
Figure 1: Micron and NexentaEdge Cluster Solution powered by Micron M510DC SSDs and advanced DRAM, NexentaEdge Software and Supermicro servers

Building the Future

What's Next in SSD Storage? Performance-Focused, Large-Scale Block and Object

Micron and Nexenta developed this tightly integrated, all-SSD solution through engineer-level collaboration, validating new concepts in software-defined, server-side SSD storage for next-generation block and object storage performance at scale.

SSD-Optimized Flexibility and Versatility

Enabling NexentaEdge with Micron's M510DC SSDs, this advanced, tightly integrated iSCSI solution offers the performance expected from state-of-the-art enterprise SSDs. With its SSD-optimized combination of flexibility, versatility and pre-engineered ease, this compact design is a high-value path to performance, flexibility, versatility and efficiency.

Scalable and Purpose-Built

Micron and Nexenta have collaboratively engineered massive, cost-effective scale from petabytes to exabytes, with class-leading performance and value — all running on Micron advanced DRAM and purpose-built M510DC SSDs.

Enabling All-Flash Data Centers Now

Micron and Nexenta are accelerating an easier, faster migration to the all-flash data center. Move your OpenStack® clouds, active archives, containers and big data infrastructure to this pre-engineered, tightly integrated all-SSD solution for outstanding results and better overall value.

Features of NexentaEdge Software

Key benefits, per the NexentaEdge data sheet: [1]

- **Next-Generation Design:** Scale-out, shared-nothing architecture deployed on Linux standard x86 servers, multi-petabyte scale with low management overhead, fully distributed data and metadata management.
- **Data Protection and Optimizations:** Inline deduplication is performed on all data written across the entire cluster; variable size chunking ensures maximum capacity savings.
- **High Performance:** Small, random I/Os make NexentaEdge particularly adapted for large-scale virtual machine environments and transactional applications. The ability to enable high-performance data and metadata management and optimize data transfers and placement delivers faster responses and balanced performance required in today's enterprise.

## How Micron Storage Solutions Deliver

- **Optimized CPUs and DRAM:** This NexentaEdge solution offers a thoroughly pre-engineered balance among key elements for optimized performance and value.
- **Drive-Level Enhanced Data Protection:** Micron M510DC SSDs feature transparent, internal data protection features that add transparent data resiliency and seamless implementation while enabling full platform capability.
- **Reduced Command/Access Latency:** Firmware enhancements of the M510DC SSD help reduce data access times for better responsiveness and lower latency.

Micron NexentaEdge All-SSD Solution: 10X IOPS: 75% Read /25% Write, 3X IOPS 100% Read vs. Hybrid (iSCSI, 35 Active LUNS per node) [2]

8K Random 75% Read 25% Write: 5 Node Cluster (35 Active LUNS)
■ Micron All SSD Cluster ■ Hybrid Cluster
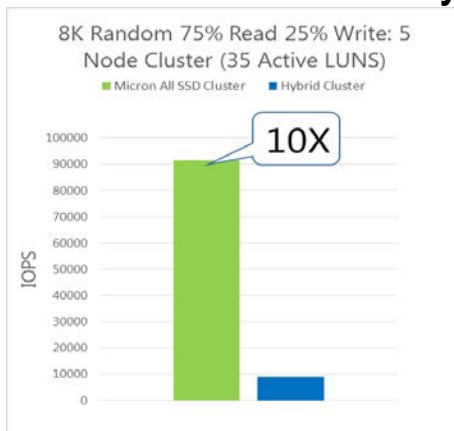
✓ NexentaEdge scale-out software, all-SSD storage
✓ Micron M510DC enterprise-class performance SSDs
✓ Supermicro standard servers

35 Active LUNS: Key loading with which hybrid designs begin to show limitations in real-world capability **75% Read and 100% Read** (both @8K 100% random): Common workloads for deployment targets

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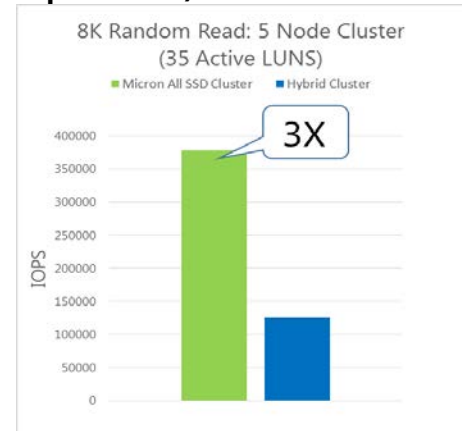
Micron and NexentaEdge Configuration[3] Quick Reference

Configuration	Single Node (RJ45)	Single Node (SFP+)	Description
Platform	SYS1028U TNRT+		1U Ultra Server
Capacity	8.6TB Data Storage		
SSDs	Storage: HDS-2TM-MTFDDAK960MBP-16 (x9) Boot: HDS-2TM-MTFDDAK240MBP-16 (x1)		Micron M510DC/960GB and M510DC/240GB
CPU	P4X-DPE52690V4SR2N2 (x2)		E5-2590V4 (14C/2.6G/9.6GT/s)
Memory	MEM-DR416L-CL03-ER24 (x16)		Micron 16GB DDR4 2400 RDIMM ECC
Controller	AOC-S3108L- H8iR-16DD		SMC3108 SAS3 12Gb/s ROC (8 port)
Networking	AOC-STG-I2T (x1)		Dual-port 10 Gb/E (RJ45)
		AOC-STGN-I2S (x1)	Dual-port 10 Gb/E (SFP+)
		AOC-E10GSFPSR (x1)	10 Gb/E SFP+ transceiver SR

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1. Source: https://nexenta.com/sites/default/files/docs/resources/NexentaEdge_Datasheet.pdf\
2. Different workloads may result in different performance values.
3. Hardware-only SKU numbers; Cluster consists of five nodes plus switches, cabling; NexentaEdge software required, available for purchase (services also available for purchase).