Micron Introduces World's Fastest, Most Energy Efficient 60TB SSD

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The industry's first E3.S 60TB SSD, the Micron ION 6550 delivers best-in-class energy efficiency at up to 67% more density per rack for exascale data centers

BOISE, Idaho, Nov. 12, 2024 (GLOBE NEWSWIRE) -- Micron Technology, Inc. (Nasdaq: MU), today announced it has begun qualification of the 6550 ION NVMe ™ SSD with customers. The Micron 6550 ION is the world's fastest 60TB data center SSD and the industry's first E3.S and PCIe Gen5 60TB SSD.[1] It follows the success of the award-winning 6500 ION and is engineered to provide best-in-class performance, energy efficiency, endurance, security, and rack density for exascale data center deployments. The 6550 ION excels in high-capacity NVMe workloads such as networked AI data lakes, ingest, data preparation and checkpointing, file and object storage, public cloud storage, analytic databases, and content delivery.

"The Micron 6550 ION achieves a remarkable 12GB/s while using just 20 watts of power, setting a new standard in data center performance and energy efficiency," said Alvaro Toledo, vice president and general manager of Micron's Data Center Storage Group. "Featuring a first-to-market 60TB capacity in an E3.S form factor and up to 20% better energy efficiency than competitive drives, the Micron 6550 ION is a game-changer for high-capacity storage solutions to address the insatiable capacity and power demands of AI workloads."

Micron 6550 ION E3.S SSD

The Micron 6550 ION E3.S SSD is the industry's first E3.S and PCIe Gen5 60TB SSD.

Delivers unmatched performance and energy efficiency

The Micron 6550 ION is the industry's first PCIe Gen5 60TB data center SSD and offers class-leading read and write bandwidth. [1] The drive is also the world's first 60TB SSD with OCP 2.5 support, introducing the active state power management (ASPM). This new feature allows the drive to idle at 4 watts in the L1 state versus 5 watts in the L0 state, improving energy efficiency up to 20% when idling. Additional power benefits come from the drive's industry-leading and energy-efficient G8 NAND, which is one to three NAND generations ahead of competing 60TB SSDs,[2] enabling the drive to achieve its published performance numbers using just 20 watts. Compared to competing 60TB drives, it delivers up to:

- 179% faster sequential reads and 179% higher read bandwidth per watt[3]
- 150% faster sequential writes and 213% higher write bandwidth per watt[3]
- 80% faster random reads and 99% higher read IOPS per watt[3]

The 6550 ION also excels in critical AI training workloads compared to competitive 60TB SSDs, achieving:

- 147% higher performance for NVIDIA® Magnum IO™ GPUDirect® Storage (GDS) and 104% better energy efficiency[4]
- 30% higher 4KB transfer performance for deep learning IO Unet3D testing and 20% better energy efficiency[5]
- 151% improvement in completion times for AI model checkpointing while competitors consume 209% more energy[6]

Even with an impressive 61.44TB capacity, the drive can be fully written in just 3.4 hours, while competing drives take up to 150% longer to fill.[7] This allows for faster drive rebuilds and AI training set preparation – improving deployment times, increasing GPU utilization, and enhancing storage resiliency in high capacity NVMe SSDs.

Reduces footprint driving data center efficiency

The Micron 6550 ION is available in E3.S, U.2, and E1.L form factors. As the world's first E3.S 60TB SSD, the 6550 offers best-in-class density, reducing rack storage needs by up to 67%.[8] It provides industry-leading space efficiency to store over 1.2 petabytes per rack unit (U).[9] By utilizing a 1U high-density server equipped with 20 E3.S drives, operators can achieve a total storage capacity of 44.2 petabytes in a single rack[10] This solution is 67% denser than 2U servers that often house a maximum of 24 U.2 drives, yielding only 26.5 petabytes per rack.[10] The 6550 61.44TB E3.S SSD, when compared to 122.88TB U.2 drives, delivers up to 3.3x the performance per terabyte.[11] This improvement allows for significant server consolidation to optimize data center space and efficiency.

Increases drive endurance and bolsters security

The drive delivers best-in-class 60TB SSD endurance with 1.0 random drive writes per day (RDWPD) for 16KB random writes, providing up to 42% more endurance than competing 60TB SSDs.[1] Additionally, the 6550 ION offers an industry-leading security feature set, including SPDM 1.2 for attestation and SHA-512 for secure signature generation. It is TAA-compliant and FIPS 140-3 L2 certifiable delivering government required levels of security.[12] The Micron 6550 ION is manufactured at multiple sites for supply chain resilience and is built with a vertically integrated architecture, including Micron DRAM, NAND, controller, and firmware.

Industry quotes:

"The introduction of the Micron 6550 ION SSD is a groundbreaking advancement for data-intensive and emerging AI applications. Such innovations in storage technologies enable dense and energy-efficient solutions that evolve our customer's infrastructure capabilities," said Raghu Nambiar,

corporate vice president, Data Center Ecosystems and Solutions at AMD. “We are excited to collaborate with Micron in enabling the ecosystem with the latest 5th Gen AMD EPYC processor-based platforms.”

“The VAST Data Platform is a unified data platform that seamlessly combines storage, databases, and compute into a single software solution, empowering customers with the capabilities needed to drive their transition to advanced computing and AI,” said Tomer Hagay, head of product at VAST Data. “By incorporating VAST’s data platform software with the Micron 6550 ION SSD, customers can achieve high capacity, high performance, and energy efficiency to meet the rigorous demands of modern AI workloads.”

“WEKA customers are achieving excellent results from their WEKA Data Platform and Micron 6500 ION deployments today. We expect the new Micron 6550 ION SSD will extend this value with enhanced performance density and energy efficiency benefits for enterprise AI environments,” said Nilesh Patel, chief product officer at WEKA. “With its impressive 61.44TB capacity, the Micron 6550 ION will enable our mutual customers to implement rack-dense AI infrastructure solutions without sacrificing performance.”

The Micron 6550 ION is now available for sampling globally and is part of Micron’s industry-leading data center SSD portfolio . To learn more about the many other industry-leading features of the Micron 6550 ION SSD, visit: www.micron.com/6550ION.

For more information, visit these additional resources:

- 6550 ION product page
- 6550 ION product brief
- 6550 ION AI workloads tech brief
- 6550 ION launch blog
- 6550 ION product image gallery
- 6550 ION NVIDIA GDS tech brief

About Micron Technology, Inc.
We are an industry leader in innovative memory and storage solutions transforming how the world uses information to enrich life for all. With a relentless focus on our customers, technology leadership, and manufacturing and operational excellence, Micron delivers a rich portfolio of high-performance DRAM, NAND and NOR memory and storage products through our Micron® and Crucial® brands. Every day, the innovations that our people create fuel the data economy, enabling advances in artificial intelligence (AI) and compute-intensive applications that unleash opportunities — from the data center to the intelligent edge and across the client and mobile user experience. To learn more about Micron Technology, Inc. (Nasdaq: MU), visit micron.com.

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[1] The Micron 6550 ION offers capacities up to 61.44TB. Comparisons are made with 61.44TB NVMe SSDs from Samsung, Solidigm and Western Digital. Comparisons use publicly available competitor information from public sources at the time of the 6550 ION announcement, with the 6550 ION and Western Digital using a maximum power of 20W and other competitive drives using 25W, resulting in 20% less maximum power consumption for the 6550 ION.

[2] Competitive 61.44TB SSDs per footnote 1 are built with NAND that is the industry’s 7 th generation or earlier, per publicly available sources at the time of the 6550 ION announcement.

[3] Based on public information available at the time of this document’s publication. Sequential performance based on a 128KB transfer size and a queue depth of 128. Competitive read and write bandwidth per watt calculated using published sequential bandwidth rating at maximum power consumption values. Random read performance based on a 4KB transfer size.

[4] Tests conducted by Micron engineering using a maximum power limit of 20W for the Micron 6550 ION and 25W for the competitive drive. 147% higher performance observed using a 4KB transfer size and 256 GDSIO workers. Energy efficiency based on measured performance and measured SSD power consumption.

[5] Tests conducted by Micron engineering using a maximum power limit of 20W for the Micron 6550 ION and 25W for the Solidigm D5-P5336. Performance and power efficiency results using the Unet3D benchmark with three simulated H100 accelerators and measured SSD power consumption during 4KB transfer size.

[6] Tests conducted by Micron engineering using a maximum power limit of 20W for the Micron 6550 ION and 25W for the Solidigm D5-P5336. DLIO checkpoint workload modeled on Llama3 405B parameter LLM. Model representing an 8 GPU server. Checkpoint size is 415GB.

[7] Calculated based on 100%, 128KB sequential write performance based on public documents available at the time of this publication.

[8] System comparison using 20 slot SSD E3.S server in 1U vs. 24 slot U.2 server in 2U. No competitor currently offers a 61.44TB capacity SSD in E3.S form factor per published specifications at the time of this announcement.

[9] Using Micron 61.44TB E3.S drives with 20 SSDs per U.

[10] Rack storage capacity assumes 36 rack units are available for server/storage systems.

[11] Based on information on Anand Tech site at https://www.anandtech.com/show/21526/samsungs-128-tbclass-bm1743-enterprise-ssd-displayed-at-fms-2024 and assumes other 122.88TB drives will have similar performance metrics.

[12] No hardware, software or system can provide absolute security under all conditions. Micron assumes no liability for lost, stolen or corrupted data arising from the use of any Micron products, including those products that incorporate any of the mentioned security features.

A photo accompanying this announcement is available at https://www.globenewswire.com/NewsRoom/AttachmentNg/2aa5c30f-9d77-4a2e-a835-cc29e5944ee7