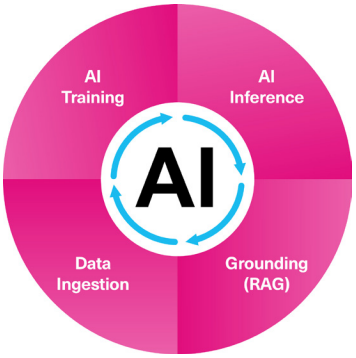
KIOXIA

Top 5 Reasons to Deploy KIOXIA LC9 Series SSDs for AI Data Ingestion Workloads

Data ingestion for AI is the essential process of gathering, cleaning and transferring raw data from diverse sources (i.e., files, databases, sensors) into a storage system (like a data lake or vector database) for training, analysis and machine learning (ML) large language model (LLM) training. It is the foundation of AI pipelines as it transforms and loads data and is critical for ensuring that AI models have access to high-quality data.



Source: Kioxia Corporation

Data volume during data ingest can be immense, especially for LLMs that depend on massive datasets. KIOXIA LC9 Series NVMe™ SSDs are ideally suited for the data ingestion stage of the AI workflow and deliver very high 245 terabyte[1] (TB) capacity and high-sequential bandwidth combined with significant power and cost advantages, since less storage racks and rack units will be required, as well as associated cooling, when compared to hard drives. It's at this stage of the AI process where storage needs to be scalable since raw data may consist of unstructured or semi-structured data that requires reformatting and preprocessing, potentially growing the dataset further.

The top five reasons to deploy KIOXIA LC9 Series SSDs for AI data ingestion workloads include:

1. *245 TB Capacity for Petabyte[1]-Scale Deployments*
2. *Next-Generation BiCS FLASH™ Generation 8 QLC NAND Technology*
3. *Purpose-Built for AI Data Ingestion Workloads*
4. *Enterprise-Ready with Ecosystem Integration*
5. *Excellent TCO through HDD Displacement*

245 TB Capacity for Petabyte-Scale Deployments

With over 245 TB per drive, KIOXIA LC9 Series SSDs can achieve unprecedented multi-petabyte (PB) storage density in a wide variety of server configurations, including standard and future 2U, 1U and custom chassis designs. This exceptional capacity allows ultra-dense AI servers or hyperscale ingestion nodes to be built without increasing the data center footprint. By consolidating more data into fewer servers and reducing the overall number of racks needed, KIOXIA LC9 Series SSDs dramatically simplify infrastructure deployments, streamline management and create new opportunities to maximize productivity and future growth, all while lowering costs associated with physical space, power and cooling.

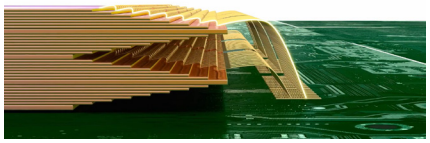
KIOXIA LC9 Series SSDs[3] (2.5-inch / E3.S / E3.L)

High-capacity KIOXIA LC9 Series SSDs yield the following storage capabilities for 2U servers:

- *Typical 24 slot 2.5-inch[2] server: over 2.9 PB (24 x 122 TB)*
- *Typical 32 slot E3.S 1T server: over 3.9 PB (32 x 122 TB)*
- *Future 40 slot E3.L 1T server: over 9.8 PB (40 x 245 TB)*

Next-Generation BiCS FLASH™ Generation 8 QLC NAND Technology

KIOXIA LC9 Series SSDs are powered by the advanced KIOXIA BiCS FLASH generation 8 quad-level cell (QLC) NAND flash memory with innovative CMOS directly Bonded to Array (CBA) technology[4] and a remarkable 32-die stack[5], each with 2 terabit[6] (Tb) capacity, enabling up to 8 TB capacity in a compact 154-BGA NAND flash package. These technological advancements, achieved through precision wafer processing, material design and wire bonding innovations, deliver the scale, speed and effectiveness required for AI-centric workloads.



BiCS FLASH generation 8 32-die stack[3]

The result is improved productivity, high performance and robust endurance that deliver cost and power benefits and are optimized for large-block sequential data ingestion and processing typical in AI pipelines, without compromising on capacity, reliability or total cost of ownership (TCO).

Purpose-Built for AI Data Ingestion Workloads

KIOXIA LC9 Series SSDs are ideally suited for the unique demands of AI and ML ingestion, where bulk data capture, rapid dataset expansion and consistent throughput are critical. Its massive capacity, high-sequential bandwidth and optimized firmware accelerate raw and unstructured data acquisition, keeping GPU clusters and analytics engines supplied and productive. By delivering consistent and reliable throughput[7], even as datasets rapidly expand, the KIOXIA LC9 Series SSDs support seamless scaling of AI pipelines and data lakes, empowering organizations to unlock deeper insights and respond to new opportunities expeditiously.

Enterprise-Ready and Ecosystem Integration

KIOXIA LC9 Series SSDs deliver an extensive array of enterprise features including U.2, E3.S, and E3.L form factor availability, support for the PCIe® 5.0 interface and NVMe™ 2.0 protocol, robust security options[8] such as SIE[9], SED[10] and FIPS 140-3 Level 2 validation[11], power loss protection[12], adjustable power settings, Open Compute Project® (OCP®) v2.5 compliant, and both single and dual-port configurations. These enterprise capabilities ensure exceptional throughput, future-proof connectivity and seamless integration into modern composable and disaggregated IT environments, all while maintaining the highest standards of reliability.

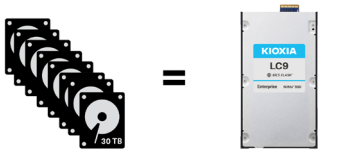
Excellent TCO through HDD Displacement

By delivering the capacity of potentially dozens of HDDs in a single SSD, as well as orders-of-magnitude higher performance, KIOXIA LC9 Series SSDs enable rapid consolidation of legacy HDD storage tiers. A single 245 TB KIOXIA LC9 Series SSD can replace nearly 25 traditional 10 TB enterprise HDDs, or up to eight 30 TB enterprise HDDs, dramatically reducing the total number of drives required for multi-petabyte installations while saving a significant amount of power.

For a 40 slot E3.L 1T server, the achieved KIOXIA LC9 Series capacity is 9.8 PB (40 x 245 TB) with an associated power consumption of 1,000 watts (25 W per drive x 40). A comparable hard drive configuration would require eight 30 TB HDDs (240 TB capacity total) for each KIOXIA LC9 Series SSD at 245 TB capacity or 320 HDDs (8 HDDs x 40). The total HDD power consumption at 9 W per drive is 2,880W (9 W x 320), representing ~2.9x savings in power consumption.

Along with up to 100x faster throughput and lower latency, this consolidation slashes operational complexity, reduces maintenance demands and frees up valuable IT resources.

More information is available here.



8 x 30 TB HDDs | 1 x 245 TB SSD[3]

It takes eight 30 TB HDDs to equal the same massive storage capacity as one 245 TB E3.L SSD

KIOXIA LC9 Series NVMe SSDs

Preliminary Specifications[13]

PCIe Gen5 Performance

Sequential Read: *up to 12,000 MB/s**

Sequential Write: *up to 3,000 MB/s*

Random Read: *up to 1,300 KIOPS^*

Random Write: *up to 80 KIOPS*

**MB/s = megabytes per second*

^IOPS = input/output operations per second

Supported High Capacities

30.72 TB - 61.44 TB - 122.88 TB - 245.76 TB

Notes:

[1] Definition of capacity: KIOXIA defines a kilobyte (KB) as 1,000 bytes; a megabyte (MB) as 1,000,000 bytes, a gigabyte (GB) as 1,000,000,000 bytes, a terabyte (TB) as 1,000,000,000,000 bytes and a petabyte (PB) as 1,000,000,000,000,000 bytes. A computer operating system, however, reports storage capacity using powers of 2 for the definition of 1Gbit = 2^{30} bits = 1,073,741,824 bits, 1GB = 2^{30} bytes = 1,073,741,824 bytes, 1TB = 2^{40} bytes = 1,099,511,627,776 bytes and 1PB = 2^{40} bytes = 1,125,899,906,842,624 bytes and therefore shows less storage capacity. Available storage capacity (including examples of various media files) will vary based on file size, formatting, settings, software and operating system, and/or pre-installed software applications, or media content. Actual formatted capacity may vary.

[2] 2.5-inch indicates the form factor of the SSD and not its physical size.

[3] The product images shown are representations of the design models and not accurate product depictions.

[4] Source: KIOXIA Corporation, as of July 3, 2024.

[5] Source: KIOXIA America, Inc. as of August 5, 2025.

[6] The flash memory capacity is calculated as 1 terabit (1 Tb) = 1,099,511,627,776 (2^{40} bits).

[7] Read and write speed may vary depending on various factors such as host devices, software (drivers, OS, etc.) and read/write conditions.

[8] Optional security feature compliant drives are not available in all countries due to export and local regulations.

[9] SIE: Sanitize Instant Erase is compatible with the Sanitize device feature set, which is the standard prescribed by NVM Express™, Inc., first introduced in the NVMe v1.3 specification, and improved in the NVMe v1.4 specification, and by the T10 (SAS) and T13 (SATA) committees of American National Standards Association (ANSI).

[10] A Self-Encrypting Drive (SED) encrypts/decrypts data written to and retrieved from an SSD via a password-protected alphanumeric key, continuously encrypting and decrypting the data. In support of the SED security option (TCG-Opal/Ruby), there are a limited number of features not supported.

[11] FIPS 140-3 Level 2 SED validation validates that an SSD's cryptographic module is in compliance with the FIPS 140-3 standard developed by the National Institute of Standards and Technology (NIST) through its rigorous Cryptographic Module Validation Program (CMVP) certification process.

[12] PLP: Power Loss Protection supports recording data in buffer memory to NAND flash memory, utilizing back up power of solid capacitor in case of sudden supply shut down.

[13] KIOXIA LC9 Series SSD performance specifications are preliminary and subject to change. Read and write speed may vary depending on various factors such as host devices, software (drivers, OS, etc.) and read/write conditions.

Trademarks:

Disclaimers: