



## Frequently Asked Questions

# Questions You Should Ask About KIOXIA LC9 Series SSDs

## The Next Generation in High-Capacity AI and Data Center Storage

### What are KIOXIA LC9 Series SSDs?

Announced in July 2025, the [KIOXIA LC9 Series](#) are first generation NVMe™ SSDs designed for tomorrow's biggest storage requirements as they are equipped with the capacities, form factors and features to address the most demanding AI, object storage and massive data lake requirements. These SSDs feature capacities up to 245 terabytes<sup>1</sup> (TB) driven by BiCS FLASH™ generation 8 technology that features a [32-die stack](#), each with 2 terabit<sup>2</sup> (Tb) capacity in a QLC die, resulting in an impressive 8 TB capacity within a single NAND flash package. The KIOXIA LC9 Series represents one of the world's highest capacities and most dense SSDs<sup>3</sup>.

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

- *Typical 24 slot 2.5-inch<sup>4</sup> server: over 2.9 petabytes<sup>1</sup> (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)*



KIOXIA LC9 Series SSDs<sup>5</sup>  
(2.5-inch / E3.S / E3.L)

### How Can AI Workloads Benefit from 245 TB Capacity SSDs?

AI, machine learning (ML) and analytics workloads are growing significantly, with large language models (LLMs) requiring access to vast amounts of high-quality data. The groundbreaking 245 TB capacity featured within the KIOXIA LC9 Series is engineered to keep up with the evolving demands of data-intensive applications and deliver value in multiple ways:

- *Dataset Scalability: The ability to process and store enormous AI/ML datasets that eliminate the need to shard data across many drives. This scalability simplifies data management and reduces organizational overhead.*
- *Accelerate Insights: Locally available high data capacity means shorter training times, faster inferencing and real-time access to large datastores for LLM development and fine-tuning.*
- *Lower Latency / Higher Throughput: By minimizing the need for cross-server or cross-rack data movement, KIOXIA LC9 Series SSDs deliver lower latency and higher sustained throughput, even for the most IO-intensive workloads.*
- *Future-Proof Investments: As AI LLM demand continues to surge, KIOXIA LC9 Series SSDs help infrastructures to scale without frequent hardware refreshes.*

## Which SSD Form Factors are Supported by the KIOXIA LC9 Series?

KIOXIA LC9 Series SSDs are available in U.2 (2.5-inch) and EDSFF (E3.S, E3.L) form factors offering flexibility for hyperscale, enterprise and cloud deployments.

- *U.2 is widely adopted and provides broad compatibility with existing servers and storage systems making them ideal for seamless upgrades and integration into current infrastructures. It enables high-performance NVMe™ connectivity in a familiar 2.5-inch drive format.*
- *E3.S (Short) is optimized for next-gen 1U and 2U servers, delivering advanced thermal capabilities, serviceability and support for PCIe® 5.0 and generations beyond.*
- *E3.L (Long) is ideal for ultra-dense storage systems, maximizing petabyte-per-rack capacity while simplifying cabling and deployment.*

These form factors enable data centers to reach unprecedented storage densities needed for modern data-intensive workloads:

- *2.5-inch SSDs: up to 122 TB for the most common servers today*
- *E3.S SSDs: up to 122 TB for all flash-centric servers*
- *E3.L SSDs: up to 245 TB for ultra-capacity all-flash servers/storage*

## What Enterprise Capabilities are Supported by the KIOXIA LC9 Series?

KIOXIA LC9 Series SSDs provide true enterprise-class capabilities:

- *Dual-Port Support: Enables flexible connectivity options for redundancy and improved availability across diverse storage infrastructures.*
- *End-to-End Data Protection: Safeguards data during transfer, storage and retrieval.*
- *Reliability & Security: Built with enterprise-grade components featuring security options<sup>6</sup> and encryption capabilities such as Sanitize Instant Erase<sup>7</sup> (SIE), Self-Encrypting Drive<sup>8</sup> (SED), Advanced Encryption Standard (AES) 256-bit hardware encryption, support for Trusted Computing Group<sup>9</sup> (TCG) enterprise protocols and FIPS 140-3 Level 2 SED validation<sup>9</sup>.*
- *Power Loss Protection<sup>10</sup> (PLP): Preserves mission-critical data, even in unexpected power events enabling a drive to flush data from DRAM to NAND flash memory. Protects in-flight data, prevents mapping table corruption and enhances data integrity.*
- *Advanced NVMe 2.0 Features: Some of the key ones include:*
  - *Robust namespaces to isolate data, manage multi-tenancy and optimize performance by dividing a single physical drive into multiple, addressable volumes*
  - *Virtualization support that pools physical capacity from multiple networked drives into a single, centrally managed logical unit.*
  - *Advanced management for today's composable infrastructure needs.*
- *Predictive Telemetry & S.M.A.R.T. Monitoring: Predictive telemetry analyzes real-time and historical data using ML to anticipate potential issues before they cause failures or downtime. Self-Monitoring, Analysis, and Reporting Technology (S.M.A.R.T.) detects and reports various indicators of drive reliability or how long a drive can function while anticipating imminent hardware failures.*
- *Flexible Power Profiles: Enables drives to operate efficiently in dense, high-temperature data centers without compromising reliability or performance.*

## What Applications is the KIOXIA LC9 Series Best Suited?

With the combination of staggering capacities, blazing speed and enterprise reliability, KIOXIA LC9 Series SSDs are purpose-built for:

- *AI/ML Workloads: Accelerates the data ingestion stage of the AI workflow and delivers very high-capacity and high-sequential bandwidth combined with flexible power profiles and cost efficiency.*
- *Analytics & Data Warehousing: Enables faster extract, load and transform (ELT) and real-time data crunching for business intelligence applications.*
- *Hyperscale Cloud Services: Delivers premium, large-scale NVMe™ as a service for next-gen cloud workloads.*
- *Media & Content Streaming: Seamlessly stores and serves ultra-high-resolution video or massive content archives.*
- *Virtualization & Software-Defined Storage: Support dense, multi-tenant environments with linear scalability and guaranteed quality of service (QoS).*

## How Can the KIOXIA LC9 Series Help with HDD Consolidation?

The KIOXIA LC9 Series SSDs make large-scale HDD consolidation practical while unlocking these benefits:

- *Storage Racks to Rack Unit: Replace hundreds of legacy 2.5-inch HDDs with a handful of KIOXIA LC9 Series SSDs to reclaim data center space for compute or new storage requirements.*
- *Operational Efficiency: Simplify drive management, reduce failure points and streamline service with hot-pluggable E3.S and E3.L form factors.*
- *Energy & Cooling Savings: Leverage dramatic reductions in power and cooling needs compared to mechanical hard drives.*
- *Superior Performance: Elevate all-flash workloads with consistent low latency, high input/output operations per second (IOPS) and multi-gigabyte per second throughput.*

Transitioning to KIOXIA LC9 Series SSDs set the foundation for next-gen all-flash, high-density infrastructures delivering on business imperatives: faster data, smarter AI and a greener, leaner data center.

## What TCO Benefits Can Be Achieved with the KIOXIA LC9 Series?

A top-level total cost of ownership (TCO) comparison is presented in the table below that compares three KIOXIA LC9 Series configurations (122 TB / 61 TB / 30 TB) in a 2U, 40-drive server to a 245 TB baseline configuration:

KIOXIA LC9 Configuration	Server* Drive Count	Server Capacity	Server(s) Needed for 9.8 PB	HW/Infra Cost Multiplier*	Rack Units Needed	SSD Power Consumption^	Server/Rack Space to Achieve Baseline Capacity
40 x 245 TB	40	9.8 PB	1	Baseline (1x)	2U	<b>1,000 W</b> (25 W/drive x 40)	1 server, Maximum density, 4.9 PB/rack unit
40 x 245 TB	40	4.8 PB	2	2x	4U	<b>2,000 W</b> (1,000 W x 2 servers)	2 servers (+infra), 2.45 PB/rack unit
40 x 61 TB	40	2.4 PB	4	4x	8U	<b>4,000 W</b> (1,000 W x 4 servers)	4 servers (+infra), 1.22 PB/rack unit
40 x 30 TB	40	1.2 PB	8	8x	16U	<b>8,000 W</b> (1,000 W x 8 servers)	8 servers (+infra), 0.61 PB/rack unit

\* Dell™ PowerEdge™ R7725xd Server

^ Accounts for server count, rack units, switching, power, cooling, OPEX, etc.

• Assumes each drive operates at up to 25 W maximum draw. Actual power may vary.

When targeting ultra-high-density storage on a single 2U server, KIOXIA 245 TB LC9 Series SSDs deliver up to 9.8 PB per Dell™ PowerEdge™ R7725xd Server (40 x 245 TB drives). To achieve similar data center capacity with 61 TB SSDs would require four times as many servers, racks and supporting infrastructure. The domino effect is significantly higher hardware, licensing and power consumption costs, not just from the drives themselves, but also from the additional networking, switching, cooling and system overhead that is also required to support more servers and racks. With its design to maximize density, KIOXIA LC9 Series SSDs enable substantial TCO and operational efficiency gains ideally suited for hyperscale, AI and enterprise environments.

More information on KIOXIA LC9 Series SSDs is available [here](#).

**Notes:**

<sup>1</sup> 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<sup>30</sup> bits = 1,073,741,824 bits, 1GB = 2<sup>30</sup> bytes = 1,073,741,824 bytes, 1TB = 2<sup>40</sup> bytes = 1,099,511,627,776 bytes and 1PB = 2<sup>50</sup> 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.

<sup>2</sup> The flash memory capacity is calculated as 1 terabit (1 Tb) = 1,099,511,627,776 (2<sup>40</sup> bits).

<sup>3</sup> As of July 29, 2025. Based on KIOXIA Corporation survey.

<sup>4</sup> 2.5-inch indicates the form factor of the SSD and not its physical size.

<sup>5</sup> The product images shown are representations of the design model and not accurate product depictions.

<sup>6</sup> Optional security feature compliant drives are not available in all countries due to export and local regulations.

<sup>7</sup> 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).

<sup>8</sup> 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.

<sup>9</sup> 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.

<sup>10</sup> 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.

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