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The Pulse of Modern Healthcare Tech: How Flash Memory and SSD Innovation Supports Critical Workflows

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The Data Explosion in Healthcare

Do patients and their doctors think about data storage when discussing healthcare needs and treatment plans? Probably not. However, successful patient healthcare management would frequently not be possible without the real-time, secure access to large volumes of healthcare data that enable clinicians to diagnose conditions, review options, make decisions, and evaluate progress.

Technology has transformed healthcare delivery in ways hardly imaginable a few decades ago. The data-driven systems and applications that enable physicians, nurses and other healthcare professionals to address complicated medical issues have had direct impact on patient health planning, health management, and quality of life.

Managing, maintaining and improving these complex healthcare technology environments comes with its own set of challenges, though. In addition to the standard priorities IT leaders face when delivering modern technology services to their organizations, healthcare CIOs are presented with unique conditions—and opportunities—that require specialized approaches for ensuring high-quality patient care.

Recent advances in artificial intelligence (AI) and its role in healthcare, such as the use of AI in radiology analysis, have contributed to exciting new approaches in medicine. However, these and other data-driven technology advances will put continued pressure on IT systems and infrastructure to keep pace, particularly when it comes to the demands on storage capacity, speed and security. Choosing the right data storage infrastructure is critical for healthcare technology professionals who want their IT strategies to address the current data explosion that could expand and grow significantly.

As the inventor of NAND flash memory and a leading supplier of solid state drives (SSDs), KIOXIA offers a wide portfolio of solutions that may support a variety of healthcare applications and use cases. In this paper, we explore the key drivers of healthcare data growth and why KIOXIA technology can be an important component of a healthcare organization's storage infrastructure.

Healthcare Data Accumulation Stretches Capacity

Driven by trends such as the 10-fold increase in the use of Electronic Health Records (EHRs) by hospitals between 2009-2021, as noted by American Hospital Association (AHA),[1] healthcare data has grown significantly in recent years. This is a daunting challenge when you realize the storage systems required to handle such volumes of data. How can a healthcare organization's IT infrastructure scale to manage data that is increasing so rapidly?

Modern technology solutions that have become indispensable in the effective treatment of patients generate significant data compared to other industries. Sophisticated medical equipment like MRIs and CT scanners that produce large, high-resolution images enable physicians to make precise diagnoses of many patient conditions. A typical medical image ranges in size from a few megabytes to several hundred megabytes or larger. When you consider that a single MRI brain scan may generate hundreds or thousands of images (or slices), the demands on storage capacity are enormous.

Picture Archiving and Communication Systems (PACS) that clinicians use to manage and transfer medical images rely on back-end storage infrastructure with immense capacity. These systems must not only be able to store significant volumes of data but also be exceptionally responsive to enable the secure, rapid processing and real-time analysis of medical images.

PACS is just one application driving significant data growth in healthcare. Electronic Health Records (EHR), hospital information systems, AI training of healthcare data and more are contributing to the tremendous growth of digital healthcare tools, as noted by AHA.[1] KIOXIA enterprise and data center SSD products include several models that are well equipped to meet the demands of AI and healthcare data growth. The KIOXIA LC9 Series[2] is PCIe® 5.0, NVMe™ 2.0 compliant and the industry's first 245.76 terabyte (TB)[3] capacity SSD,[4] designed specifically for AI data ingestion and massive data archives. Likewise, the high-performing KIOXIA CD9P Series[5] is a PCIe® 5.0, NVMe™ 2.0 compliant SSD that offers up to 61.44 TB capacity in 2.5-inch[6] form factor and up to 30.72 TB capacity in E3.S form factor. With significant improvements in read and write speeds over previous generations, the CD9P Series SSD is well suited for healthcare storage infrastructure environments that support AI training and inferencing workloads and require very large capacity.

Modern Patient Care Leverages Immediate Access to Data

Healthcare providers measure and analyze response times because they understand how critical it is to address medical emergencies quickly. That means caregivers take advantage of near-real-time access to data to assist them in the patient evaluation process. And given the importance of safeguarding patient data and personally identifiable information, rapid access to healthcare information must also be balanced with strict requirements in government regulations such as Health Insurance Portability and Accountability Act (HIPAA).

EHRs provide healthcare workers with important information about patient medical history and possible treatment plans. When a patient presents themself with unexplained symptoms to emergency room staff, rapid access to the patient's medical background may identify something that aids the physician in providing a recommended course of action. Having quick access to such data can greatly assist in diagnosis and treatment.

A modern, purpose-built IT infrastructure that includes high-performing storage technology provides dependable, fast and secure access to healthcare data during patient engagements. EHRs, hospital information systems and other clinical applications rely on highly responsive storage systems to deliver patient information practically in real time.

Healthcare IT professionals who want to ensure their clinical applications are supported by high-performing storage infrastructure should consider the KIOXIA CM7 Series and PM7 Series enterprise-class SSDs. The CM7 Series[7] PCIe® 5.0 and NVMe™ 2.0 interface delivers extremely high sequential read/write speeds,[8] low latency and high random input/output operations per second (IOPS), providing quick access to large imaging files (like MRIs and CT scans), EHRs, and transactional databases for prompt medical decision-making. The PM7 Series[9] dual-port 24G SAS interface also delivers high performance, ensuring the integrity, availability and speed of patient data. Both include robust security features, such as FIPS 140-3[10] validation of the drive's cryptographic engine, as well as Self-Encrypting Drives (SED) TCG Opal SSC[11] support for the CM7 Series and SED TCG Enterprise SSC[12] support for the PM7 Series.

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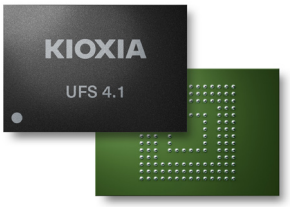
Portable Medical Devices Enable Ongoing Care

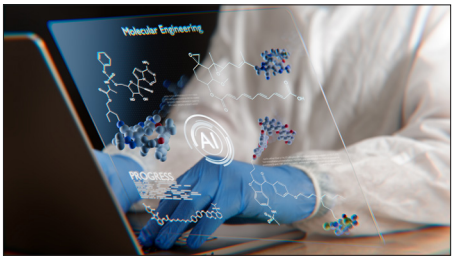
Decades ago, the ability to provide direct care typically ended when the patient left the hospital bed or physician's office. Today, many types of healthcare services can be delivered remotely via portable medical devices and monitors.

This type of portability and mobility would not be possible without technology components that are high performing, compact and energy efficient. Wearable medical devices, such as portable electrocardiograms for monitoring heart activity, must be small enough to allow free movement and include technology that is power efficient (for long battery life) and capable of collecting and transmitting significant amounts of data.

KIOXIA embedded flash memory solutions, such as e-MMC and Universal Flash Storage (UFS) flash memory, are well suited for these types of health-related use cases and environments. KIOXIA recently announced UFS 4.1,[13] with supported densities up to 1TB and improvements over previous generations in read/write performance, power efficiency and more.



A Healthier Future Powered by Data and Innovation



One can argue that healthcare innovation has a greater impact on our lives than any other industry's technology advances. The ecosystem of institutions, clinicians, businesses and thought leaders contributing to this progress is vast, global and generally well aligned on improving population health. Data-driven medical systems and applications will continue to play a major role in patient care, particularly with the growth of AI in the healthcare space.

Building higher-capacity and higher-performing flash memory solutions isn't just about achieving new technology breakthroughs, it's about enabling the potential for better patient engagement. IT leaders in the healthcare arena can count on KIOXIA to be a key SSD and flash memory supplier driving storage technology innovation to meet their critical needs.

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FOOTNOTES:

[1] American Hospital Association (AHA) Annual Survey Information Technology Supplement, 2008-present. National Center for Health Statistics (NCHS) National Ambulatory Care Survey (2008-2011) and National Electronic Health Record Survey (2012-present).

[2] The KIOXIA LC9 Series specifications are preliminary and subject to change. The product images shown are representations of the design models and not accurate product depictions.

[3] Definition of capacity: KIOXIA Corporation defines 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.

[4] Industry's first 245.76 TB NVMe SSD as of July 21,2025, KIOXIA press announcement: KIOXIA Announces Industry's First 245.76 TB NVMe SSD Built for the Demands of Generative AI Environments | KIOXIA - United States (English)

[5] The KIOXIA CD9P Series specifications provided by KIOXIA Corporation are preliminary and subject to change. The product images shown are representations of the design models and not accurate product depictions.

[6] 2.5-inch indicates the form factor of the SSD and not its physical size.

[7] The KIOXIA CM7 Series specifications provided by KIOXIA Corporation are preliminary and subject to change. The product images shown are representations of the design models and not accurate product depictions.

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

[9] The KIOXIA PM7 Series specifications provided by KIOXIA Corporation are preliminary and subject to change. The product images shown are representations of the design models and not accurate product depictions.

[10] FIPS SED optional model utilizes a security module designed to comply with FIPS 140-3, which define security requirements for cryptographic module by NIST (National Institute of Standards and Technology). For the latest validation status, please make inquiries through "Contact us" in each region's website, https://www.kioxia.com

[11] SED optional model supports TCG Opal and Ruby SSCs. It has few unsupported features of TCG Opal SSC. For more details, please make inquiries through "Contact us" in each region's website, https://www.kioxia.com

[12] SEP optional model supports TCG Enterprise SSC.

[13] The KIOXIA UFS 4.1 specifications provided by KIOXIA Corporation are preliminary and subject to change. The product images shown are representations of the design models and not accurate product depictions.

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