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KIOXIA Value SAS Self-Encrypting Drives Help Protect Data Without a Performance Hit

Prowess Consulting testing reveals that KIOXIA RM6 Series Value Serial-Attached SCSI (SAS) self-encrypting drives (SEDs) with hardware encryption outperform file system software encryption at budget-friendly pricing.

Safeguarding confidential and sensitive information is accomplished by encrypting your storage drives using hardware or software. Some encryption methods, such as the popular Linux® unified key setup (LUKS) file system encryption, secure data but result in significant storage performance reduction.[2] The alternative of not encrypting data has significant risks.

To find a solution to this performance-versus-security tradeoff, Prowess Consulting conducted benchmark testing on value serial-attached SCSI (SAS) self-encrypting drives (SEDs). We started with the hypothesis that hardware-encrypted workloads would perform on par with unencrypted workloads and better than software-encrypted workloads.

To test our theory, our engineers configured an Apache Kafka® server platform using KIOXIA RM6 Series Value SAS SEDs for storage. We used this system to run three types of encryption tests:

1. **No encryption:** Workloads with the KIOXIA Value SAS SED built-in encryption disabled
2. **Hardware encryption:** Workloads with the KIOXIA Value SAS SED built-in encryption enabled
3. **File system encryption:** Workloads with the KIOXIA Value SAS SED built-in encryption disabled and LUKS used for data encryption

Highlights:

The KIOXIA Value SAS SED's built-in hardware encryption outperforms Linux® unified key setup (LUKS) file system software-based encryption, delivering up to:

5.29x
faster
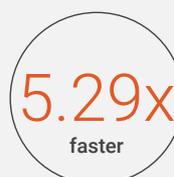
read-storage speed[1]

15%
higher

encrypted read-storage throughput[1]

9%
higher
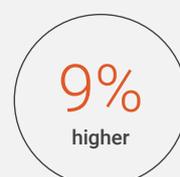
encrypted write-storage throughput[1]

Our test results confirmed that KIOXIA RM6 Series Value SAS SEDs offer a high-performance solution for securely storing your data. Hardware encryption on the solid-state drives (SSDs) consistently outperformed file system encryption for random read-data and write-data. In a separate study comparing value SAS and SATA technologies, our price-performance analysis concluded that SAS drives can provide up to 43% better performance per dollar (measured in US dollars [USD]) than SATA drives.[3]

In summary, our findings indicate that KIOXIA value SAS SED storage SSDs offer a powerful combination of robust data protection, high-speed storage, and budget-friendly pricing.

Learn More

Get the full story by reading the technical research report, "Life After SATA: KIOXIA Value SAS SEDs Protect Data with Encryption Without a Performance Hit."

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[1] Prowess Consulting. "Life After SATA: KIOXIA Value SAS SEDs Protect Data with Encryption Without a Performance Hit."
https://www.prowesscorp.com/project/kioxia-sas-value-ssd-security-encryption-performance.

[2] Sovereign Cloud Stack. "Performance impact of disk encryption using LUKS." February 2023. https://scs.community/2023/02/24/impact-of-disk-encryption/.

[3] Prowess Consulting. "A Big Step Up from SATA: Testing KIOXIA RM6 Series Value SAS SSDs." April 2023.
https://prowessconsulting.com/project/kioxia-sas-value-ssd-outperforms-sata/.