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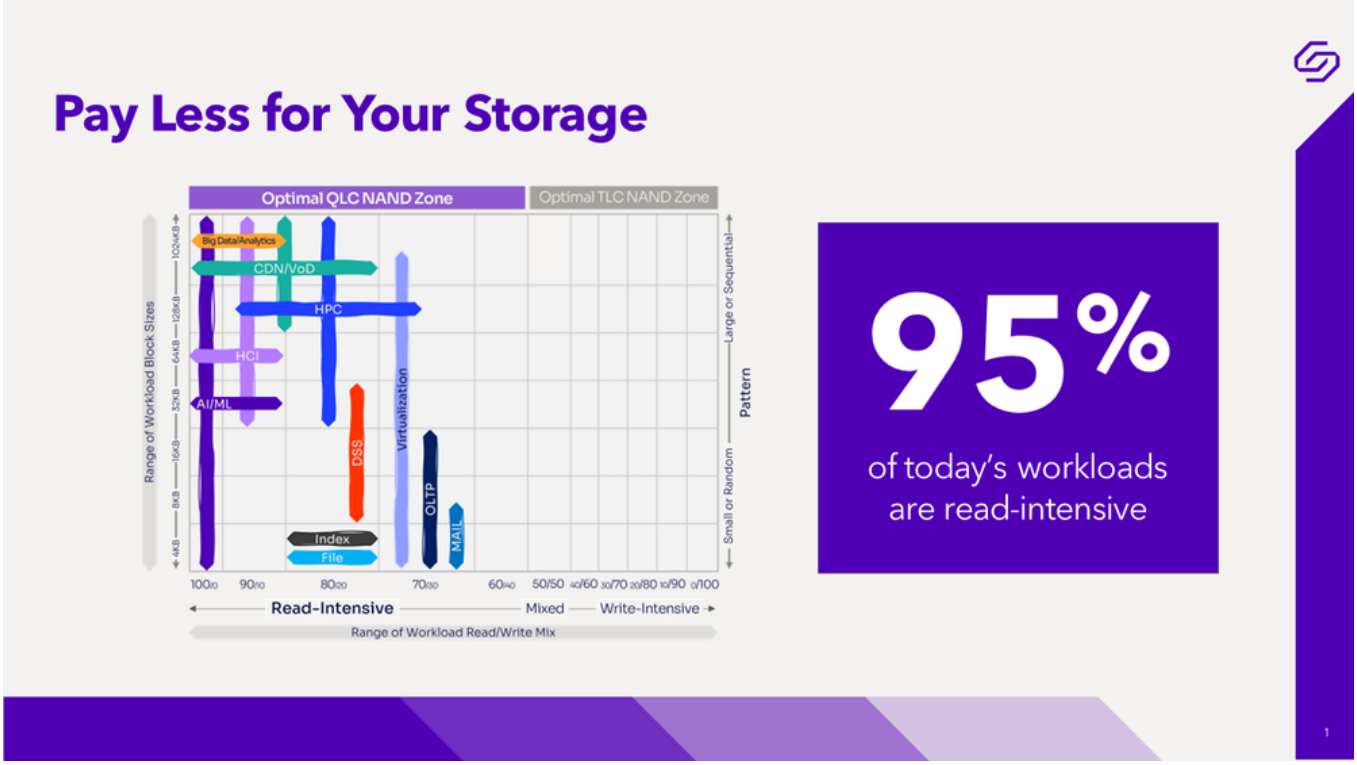
Actionable Ways to Improve Your Cloud Storage

Takeaways from Solidigm's keynote at Cloudfest 2023

Solidigm Sales Director Alexey Rogachkov recently gave a keynote at Cloudfest 2023 about how cloud providers could reduce their physical footprint and save on overall TCO by deploying high-density, high-performance data storage. The following includes key points he shared.

When SSDs were first deployed in data centers in the 2010s, the behavior of the drives—as well as the requirements of workloads—were not understood like they are today. With the benefit of hindsight, we now realize that storage architects tended to "oversize" SSDs. This is obvious when we compare the average endurance level of solid-state storage drives (SSDs) shipped years ago to current models. Today, about 85% of SSDs shipped to data centers have an endurance of ≥1 drive writes per day (DWPD), which meets the needs of today's applications at a lower cost than ≥3 DWPD [1].



The reason for this right-sizing is that workloads and drive behaviors are better understood now. In the case of SSD endurance, studies with massive sample sizes show that 99% of systems use, at most, 15% of a drive's usable endurance by its end-of-life. [2] Bottom line? QLC SSDs will not wear out as quickly as they once appeared to. And, depending on the workload, you could be overpaying for data storage.

Affordable, sustainable SSDs: a real-world application

The good news is that affordable storage is also more sustainable storage. Let's take a look at a large international streaming service, also known as a content delivery network (CDN). Its team members needed better performance and better capacity. Here's how they benefited from implementing SSDs into their data server:

1. Significantly reduced physical footprint

A CDN provider moved from a hybrid storage solution of HDDs and TLC SSDs to an all-QLC mid-tier solution. They found that they could achieve a 4.9x server footprint reduction[3] using Solidigm QLC SSDs, which offered an alternative to HDDs and to TLC NAND SSDs for affordably modernizing storage to better support on-demand content delivery.
Read performance equivalent to TLC NAND SSDs and much higher than HDDs, Solidigm QLC 3D NAND SSDs enabled storage architects to reduce TCO, efficiently scale content, and expand content to more users.

2. Reduced overall physical weight

The combination of QLC's smaller physical storage footprint and greater gigabytes (GB) per pound/kilogram had huge implications for its data center design, becoming even more critical in its multi-story data center designs.

3. Reduced overall power

Higher density storage and a smaller server footprint helped to reduce total energy costs by as much as 4%. [3] This is a huge savings, depending on the size of the infrastructure, which this CDN was able to leverage when they decreased power usage and costs.

4. Better cooling capability

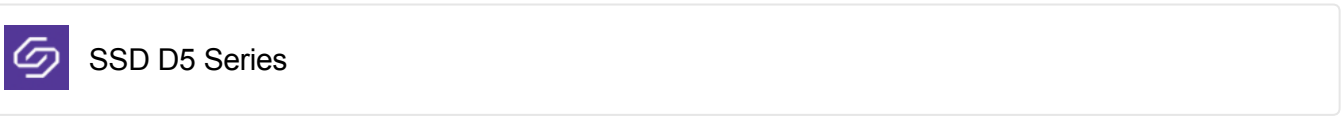
With greater density SSDs, fewer servers are deployed which results in a cooler environment. On top of that, Enterprise & Data Center Form Factors (EDSFF) are becoming more widely adopted by the industry with each passing year and are designed for better air flow, amplifying that savings.

5. More efficient end of life disposal

Higher density storage means 3.5x fewer drives to dispose of or otherwise disposition at end-of-life in that same mid-tier CDN solution. [3]

Conclusion

High-density, high-performance data storage can reduce the physical footprint in the data center and save on overall TCO. With Solidigm QLC SSDs, there is no need to sacrifice cost for performance; or performance for capacity. QLC SSDs have it all.



Footnotes:

[1] Forward Insights Datacenter, May 2019. Approximately of projected worldwide Data Center SSDs shipments 2020-2023 rated at ≤1 DWPD endurance.

[2] University of Toronto study of 1.4 million industry SSDs in Enterprise Storage Deployment. *A Study of SSD Reliability in Large Scale Enterprise Storage Deployments , https://www.usenix.org/conference/fast20/presentation/maneas*

[3] Solidigm. Solution requirements: A mid-tier CDN solution delivering BOTH 480TB of total capacity and 190 Gbps throughput per node. Source - Solidigm. https://www.intel.com/content/dam/www/central-libraries/us/en/documents/replace-legacy-storage-in-cdn-with-qlc-ssd-brief.pdf. See solution configuration details in Appendix A.

Headquartered in California, Solidigm is powered by the inventiveness of more than 2,000 employees in 20 locations around the world. For more information, please visit solidigm.com and follow us on Twitter at @Solidigm and on LinkedIn.

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