

QLC NAND Technology Does More for Your Enterprise

The vast majority of
information needs to
be read quickly ...
not rewritten
repeatedly

Get Flash Benefits for More of Your Read-Intensive Workloads

Unleash the value of massive, read-centric workloads quickly and easily — and transform your data into a strategic asset — with Micron's quad-level cell (QLC) NAND flash storage. High-capacity QLC technology lets you access data faster so you can serve it quickly, understand it more completely and act on it sooner — driving a better user experience.

QLC NAND packs 33% more data into every cell compared to its triple-level cell (TLC) equivalent. QLC's additional storage density — coupled with a more approachable price point — can have an immense effect on your read-mostly workloads (TLC is best for mixed use).



Figure 1: QLC is ideal for read-mostly workloads, TLC for read/write (mixed-use)

Scale Your Data Center for Less

QLC makes it affordable to move more enterprise applications to flash-based SSDs, which provide near-instant access to read-centric data.

Take the QLC Quiz

1. How much of your data falls into these categories?

Business information, big data analytics, content distribution, video on demand, active archives storing immense data volumes, or multi-node, read-heavy databases slowed by HDD storage

2. What do they all have in common?

They are read far more often than they are written. To be effective, they must be read quickly and efficiently.

3. What if you could unlock your data's latent value?

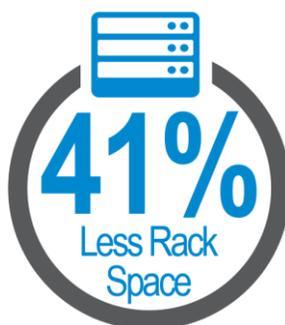
By accessing it faster, understanding it better and serving more of it to more users — all at a more economic price point.

4. How can Micron empower you?

Our high-density QLC technology provides an opportunity to move more applications from HDDs to flash with the right combination of capacity, reliability and low total cost of ownership (TCO).



Read-Focused Benefits of QLC Storage vs. HDD¹

 <p>Performance-focused, read-centric workloads rely on massive arrays of HDDs to deliver the results that applications and users demand. QLC storage does it with fewer drives.</p>	 <p>Consuming less power means less to cool and better workload efficiency. QLC storage draws about 3X less read I/O power per drive compared to similar-capacity HDDs.</p>	 <p>With four bits per NAND cell, get more density in your crowded data center with QLC SSD's compact form factors (vs. the typical 3.5 inch of high-capacity HDDs). QLC storage takes up 41% less rack space than similar-density HDDs.</p>
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Ideal Applications of QLC

Application	How QLC Builds Value
Real-Time Analytics and Big Data	Get a performance uplift for the big data "back end." For example, a Hadoop Distributed File System can deliver more value with high-capacity storage that's affordable and lightning-quick.
Business Intelligence and Decision Support Systems	Quickly mine massive data sets using faster, deeper queries — letting you build more responsive and detailed analytics for better insights.
Active Archives and Large Block Storage	Transform your active archive from a storage resource into a strategic data asset and deliver massive large-block data streams with ease.
Read-Intensive Artificial Intelligence (AI)	Get the kind of speed that AI Algorithms depend on to quickly identify patterns in large data sets with fast, high-capacity storage.
Machine and Deep Learning	Build with speed at an approachable price point for immense data sets — because machines can only learn as fast as they can read and analyze data.
Content Delivery, Video on Demand, Content Streaming	Deliver more assets to more users more consistently with support for massive, parallel requests and streams.
NoSQL Databases	Breathe fresh life into data-driven workloads like content classification and tagging as well as user profile acceleration.
User Authentication	Perform quick authentication with quick storage.

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1. All comparisons based on a 3.5-inch 8TB 7200RPM HDD. TCO statement based on common read-centric workload of 128K 95% read, estimations for similar performance (total capacity is different); 3X lower power comparisons based on public power consumption specifications for HDDs and Micron 5210 enterprise QLC SSD; 41% less rack space based on 42U rack (fully populated), 50PB data set, 2.5-inch 7.68TB Micron 5210 enterprise QLC SSDs, 8TB 3.5-inch enterprise SATA HDDs and high-density 2U servers capable of supporting 32X 2.5-inch or 18X 3.5-inch form factor devices per chassis, RAID 0.

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