intel

Intel Technologies Unlock Storage Performance

Unleash application performance using Intel® Optane™ technology, Intel® QLC technology, and Intel® Cache Acceleration Software
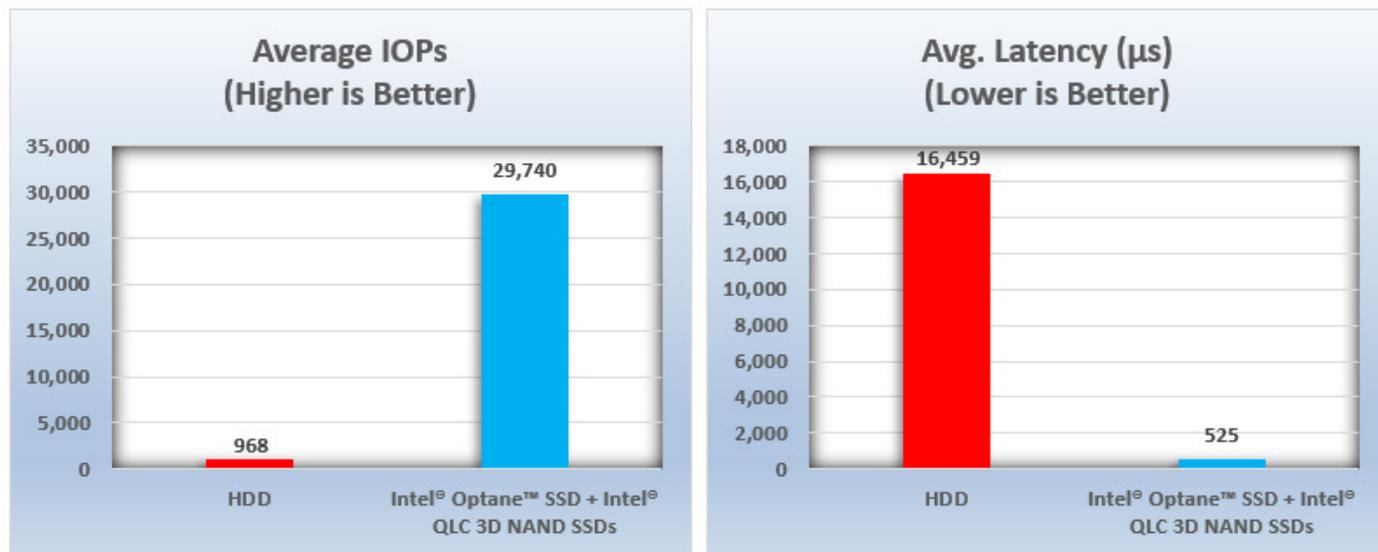
Challenge: Commonly utilized HDD media lacks the performance required for high-speed storage applications

Even in today's many modern datacenters, HDDs are still a common storage type used by numerous end-users for various storage applications. However, due to increased demand for faster storage performance, these traditional storage types may no longer be suitable for many storage system infrastructures. To solve the performance concerns of datacenter users, Intel designed a novel solution implementing Intel® Optane™ technology, Intel® QLC Technology, and Intel® Cache Acceleration Software (Intel® CAS) to significantly increase storage application throughput.

Solution: A combination of Intel Optane technology and Intel® QLC 3D NAND SSDs delivers up to 30x increase in IOPS and 31x decrease in average latency compared to traditional HDDs[1]

All configurations were tested with the FIO tool, using a 70/30 mix of random reads and writes in a Zipfian distribution pattern, 64KB block size, and queue depth of 16. By replacing a flat HDD-based storage infrastructure with a complete storage solution consisting of an Intel Optane SSD cache powered by Intel CAS, and a back-end RAID5 array of Intel QLC 3D NAND SSDs powered by Intel® Virtual RAID on CPU (Intel® VROC), Intel demonstrated up to a 30x increase in IOPS performance as well as a 31x decrease in average latency.[1] Intel CAS merges the unparalleled performance of Intel Optane technology with the economical, high-capacity nature of Intel QLC Technology, enabling performance-minded storage solution deployments.

> Unleash the power of Intel® Optane™ technology with Intel® Cache Acceleration Software (Intel® CAS) to deliver up to 30x increase in IOPS and 31x decrease in average latency compared to traditional HDDs.[1]

Average IOPs
(Higher is Better)

	HDD	Intel® Optane™ SSD + Intel® QLC 3D NAND SSDs
Value	968	29,740

Avg. Latency (μs)
(Lower is Better)

	HDD	Intel® Optane™ SSD + Intel® QLC 3D NAND SSDs
Value	16,459	525

Conclusion

Intel is focused on replacing dated and basic storage infrastructures with storage solutions that use hardware and software innovations to create a better experience within the data center. Intel CAS and an Intel Optane SSD work together to absorb the incoming I/O and leverage the faster media of Intel Optane technology. Then, Intel QLC 3D NAND SSDs provide economic back end storage to meet capacity requirements. The solution provided here has the necessary foundation to improve the performance and responsiveness of your I/O-bound applications.

For more information about solutions with Intel® CAS, visit: http://www.intel.com/cas