

Intel[®] Optane[™] SSDs

Fuel data-driven innovation with accelerated performance.

Every day, masses of critical data are overwhelming enterprise infrastructures. Unfortunately, traditional storage technologies are not equipped for this, as they leave a gap in data storage tiers. DRAM is too expensive to scale and NAND lacks the performance for memory. To address the gap, a storage solution that behaves like system memory is needed.

The solution
is here.

intel[®]

Intel® Optane™ Solid State Drives uniquely deliver the attributes of both memory and storage. With an industry-leading combination of high throughput, low latency, high QoS, and high endurance, Intel Optane SSDs feature a new storage tier to break traditional NAND data bottlenecks, accelerating transactions and time to insights.

Unlike NAND, Intel® Optane™ SSDs can read and write simultaneously making them completely unique and ideal for demanding storage environments.

Used for fast caching and fast storage, Intel Optane SSDs increase scale per server, and accelerate latency sensitive workloads. Data centers can now scale with confidence, deploying bigger and more affordable datasets to gain new insights and accelerate transactions.

By the
Numbers:

The Intel Optane logo is displayed on a dark blue background. It features the word "intel" in a lowercase, sans-serif font, followed by "OPTANE" in a larger, uppercase, sans-serif font. A small "TM" trademark symbol is positioned to the upper right of the "E" in "OPTANE".

**6x faster
performance**

High, Predictable Performance

Intel Optane SSDs deliver up to 6x faster performance at low queue depth workloads¹—extremely high throughput for single accesses. Where NAND-based SSDs are measured at a queue depth of 32 (SATA) or 128 (NVMe) to showcase throughput, **Intel Optane SSDs can reach 550,000 IOPS at a queue depth of 16.**² This new technology is perfectly suited to accelerate enterprise applications to new, breakthrough levels of performance.

**<30μs read
response time**

Low Latency

Intel Optane SSDs' delivers lightning-fast response times under any workload. (With NAND-based SSDs, random write operations require background media management, adding significant delay to read operations.) Intel Optane SSDs maintain consistent read response times, regardless of the write throughput. **Average read response times remain below <30μs while maintaining a 70/30 mixed read/write bandwidth of 2GB/s.**²

The Intel® Optane™ Advantage

Intel Optane SSDs are designed for high write environments, and can withstand the kind of intense traffic that is typically demanded of memory. Their extremely high endurance extends their life span, making them ideal for write-intensive applications such as online transaction processing, high performance computing, write caching, boot, and logging.

What does this new storage tier mean? **Consistent, accelerated applications, enabling more work per server.** Now data centers can leverage fast caching, fast storage, and extended memory. Caching and fast storage means dynamic placement of data allows for fast access to read and write data. Even better, this high-performing SSD meets the requirement of an application to accelerate storage access.

The infrastructure's bigger and more affordable memory from the memory pool dramatically increases the size of working sets to enable increased insights from data for scientific computing, healthcare, autonomous driving and other segments. Finally, data centers can now see cost efficient innovation, including employing Intel Optane SSDs in place of more expensive DRAM.



Choose with confidence

With over 50 years of experience, Intel is redesigning the fabric of how new systems are architected, building storage directly into the DNA of new system designs. This continuous innovation, combined with a broad storage technology portfolio, and vast ecosystem supply chain give you the freedom to confidently select the right solution for your business, delivered by a breadth of trusted ecosystem partners.

intel.
OPTANE™

¹ Source-Intel-tested:4K70/30RWPPerformanceatLowQueueDepth.MeasuredusingFIO3.1.CommonConfiguration-Intel2UServerSystem,OS:CentOS7.5,Kernel4.17.6-1.el7.x86_64,CPU: 2 x Intel® Xeon® 6154 Gold @ 3.0GHz (18 cores), RAM 256GB DDR4 @ 2666MHz. Configuration - Intel® Optane™ SSD DC P4800X 375GB compared to *Intel® SSD DC P4600 1.6TB. Intel Microcode: 0x2000043; System BIOS: 00.01.0013; ME Firmware: 04.00.04.294; BMC Firmware: 1.43.9176955; FRUSDR: 1.43. The benchmark results may need to be revised as additional testing is conducted. Performance results are based on testing as of November 15, 2018 and may not reflect all publicly available security updates. See configuration disclosure for details. No product can be absolutely secure.

² Intel drive evaluated-Intel® Optane™ SSD DC P4800X 375GB. Test and System Configuration: CPU: Intel® Xeon® E5-2687Wv43.0GHz 30MB 160W 12 cores, CPU Sockets: 2, RAM capacity: 32GB, RAM Model: DDR4 2133MHz, PCIe Attach: CPU (not PCH lane attach), Chipset: Intel C610 chipset, BIOS: SE5C610.86B.01.01.0024.021320181901, Switch/ReTimer Model/Vendor: Intel A2U44X25N- VMEDK, OS: CentOS 7.3.1611, Kernel: 4.14.50, FIO version: 3.5; NVMe Driver: Inbox, C-states: Disabled, Hyper Threading: Disabled, CPU Governor (through OS): Performance Mode; EIST (Speed Step): Disabled, Intel Turbo Mode: Disabled, P-states = Disabled; IRQ Balancing Services (OS) = Off; SMP Affinity, set in the OS; QD1 utilizes I/O Polling Mode. Performance results are based on testing as of August 31, 2018 and may not reflect the publicly available security updates. See configuration disclosure for details.

All information provided here is subject to change without notice.

Intel technologies may require enabled hardware, software, or service activation.

Performance results are based on testing as of dates shown in the configurations and may not reflect all publicly available security updates. See backup for configuration details. No product or component can be absolutely secure.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information visit www.intel.com/benchmarks.

Intel does not control or audit third-party data. You should consult other sources to evaluate accuracy.

Results have been estimated or simulated.

© Intel Corporation. Intel, the Intel logo, and other Intel marks are trademarks of Intel Corporation or its subsidiaries. Other names and brands may be claimed as the property of others.