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Meet the New, Data Center-Optimized SSDs for Boot, Logging, and Caching

With right-sized capacity; high throughput and low latency; and excellent endurance, the Intel® Optane™ SSD P1600X Series is the ideal boot drive for the modern data center.

Data center servers are usually equipped with SATA or NVMe NAND-based SSDs as boot drives. But these drives may raise concerns about performance, reliability, and cost, especially for today's data-hungry, mission-critical workloads.

Legacy boot drives are inefficient

Boot drives play a critical function in the data center, keeping thousands of servers up and running. Beyond the OS installation and boot processes, these drives also serve all application file system read and write requests. SATA SSDs' throughput is 6.5x slower than NVMe throughput,[1] making NVMe SSDs a better boot drive choice. However, even NVMe NAND drives' performance and reliability suffer under heavy write pressure. What's more, even the smallest SATA or NVMe SSDs provide far more capacity than what a boot drive requires, needlessly driving up data center costs.

The Intel® Optane™ SSD P1600X Series solves these issues. It provides consistent performance and endurance across all workloads, at an optimal capacity.

A quick look at Intel® Optane™ technology

Intel Optane technology is the first major memory and storage breakthrough in 25 years. It bridges critical gaps in the storage and memory hierarchy. This unique technology delivers an industry-leading combination of low latency, high quality of service, fast throughput, and high endurance. Unlike other SSD technology, Intel Optane SSDs can read and write simultaneously without performance degradation. By combining Intel® Xeon® Scalable processors and Intel Optane SSDs, data center architects can deliver solutions that increase overall platform performance.

Overview of the Intel® Optane™ SSD P1600X Series

The Intel Optane SSD P1600X Series offers two capacities, 58 GB and 118 GB, in the M.2 22mm x 80mm form factor, which supports high endurance and low power. These drives include the following key features:[2]
- PCIe 3.0x4 with NVMe interface
- Ultra-low latency (7µs for reads; 10µs for writes) for exceptional responsiveness
- High endurance: 6 drive writes per day (DWPD)
- Power loss protection

Consistently high throughput

In an environment of mission-critical applications and demanding customer requirements, data centers need predictable, high application performance.

intel®
OPTANE™
SSD

WHAT IT MEANS

More than 4x better

random read, write, and read/write performance versus a SATA-based Intel® SSD[3]

WHY IT MATTTERS

Operating system boot is primarily read-driven, installation is write-driven, and application file system access is typically (and sometimes heavy) random read/write. Intel Optane SSD P1600X boot drives give you predictable high throughput for all types of workloads. In addition, the ultra-low latency—typically 7μs for reads, 10μs for writes—means that mission-critical applications don't have to wait for the data they need.[4]

Right-sized capacity with room for value-added services

While most operating systems, such as Microsoft Windows Server and various flavors of Linux, require no more than 32 GB of storage capacity, most NAND-based SSDs are 240 to 480 GB (or larger). Most of the time, this extra capacity simply goes to waste.

WHAT IT MEANS

Capacity

58 or 118 GB drives keeps total cost of ownership down

Utilization

Using leftover GBs for metadata logging and caching further increases data center efficiency

WHY IT MATTERS

In today's budget-conscious IT environments, resources that are underutilized or not being used at all can negatively affect the bottom line. While NAND-based boot drives have extra capacity, their performance and endurance characteristics do not contribute to being partitioned for additional services like metadata logging and caching. The responsive, high-endurance Intel Optane SSD P1600X provides the right amount of storage for typical boot drive requirements, plus additional capacity that can be utilized instead of sitting idle.

High endurance for reliable boot drive performance

Boot drives typically have long lifetimes and are critical for server uptime. Modern data centers require boot drives that have long mean time between failures and high DWPD, especially if also used for logging and caching.

WHAT IT MEANS

2 Million

mean time (in hours) between failures

6 DWPD

supports even the most demanding boot drive environments

WHY IT MATTERS

Improved endurance can translate directly into lower total cost of ownership without sacrificing performance. With a five-year warranty, an Intel Optane SSD P1600X boot drive can significantly contribute to data center reliability and cost efficiency.

Intel Optane SSD P1600X Series Specifications[5]

Feature	Specification	
Capacity	58 GB or 118 GB	
Interface	PCIe3.0x4	
DWPD	6	6
TB written	635	1292
Performance (QD=32)	58 GB	118 GB
• Sequential 64K Read	Up to 1870 MB/sec	Up to 1760 MB/sec
• Sequential 64K Write	Up to 890 MB/sec	Up to 1050 MB/sec
• Random 4K Read (IOPS)	Up to 426K	Up to 410K
• Random 4K Write (IOPS)	Up to 224K	Up to 243K
Latency		
• Read	7μs (average)	
• Write	10μs (average)	

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