PRODUCT BRIEF

Intel® Solid State Drive (SSD) DC P4510 Series
Data Center (DC), PCI Express* (P), 64-Layer TLC 3D NAND

Better Service Levels. Broader Cloud Workloads.

Designed to deliver new levels of service efficiency, workload performance and capacity while reducing storage costs.

Built from the success of its cloud-inspired predecessor and architected with 64-layer, TLC, Intel® 3D NAND technology, the Intel® SSD DC P4510 Series delivers performance, Quality of Service (QoS), and capacity improvements to further optimize storage efficiency, enabling data centers to do more per server, minimize service disruptions, and efficiently manage at scale.

Built on NVMe specification 1.2*, these PCIe* SSDs are available in 1TB, 2TB, 4TB, and 8TB in the U.2 2.5" (15mm) form factor.

Cloud Storage Architectures Drive: How SSDs Are Built Now

Multi-cloud has become a core element for any enterprise strategy, and top cloud providers have responded by openly embracing PCIe/NVMe*-based SSDs with scalable performance, low latency, and continued innovation.

As software-defined and converged infrastructures are swiftly adopted, the need increases to maximize efficiency, revitalize existing hardware, deploy new workloads, and yet reduce operational expenditures.

The Intel® SSD DC P4510 Series meets these requirements. It significantly increases server agility and utilization, and accelerates applications across a wide range of cloud workloads.

Do More per Server

Intel's 64-layer 3D NAND enables the DC P4510 Series to double the capacity available compared to its immediate predecessor, the Intel® SSD DC P4500 Series. This increased density is the key to performing more workloads, allowing cloud service providers to increase users and data service. Better Quality of Service is ensured with an intelligent firmware algorithm that keeps host and background data read/write at an optimum balance.

With Intel® SSD DC P4510, applications will not only double the capacity per server rack but also provide up to 80% faster write rate, up to 2x better random write IOPS/TB, and up to 4x reduction of service time at a quality of service metric of 99.99% availability.

With this level of workload ability and agility, data centers can refresh existing hardware and reduce operational expenditures

Minimize Disruptions

To ensure telemetry information without disrupting on-going I/Os, the DC P4510 Series include enhanced SMART monitoring of drive health and status, using an in-band mechanism and out-of-band access. A power loss imminent (PLI) protection scheme with a built-in self test guards against data loss if system power is suddenly cut.

Coupled with our industry leading end-to-end data path protection scheme, PLI features ease deployment into high availability data centers where data corruption from system level glitches is not tolerated. Intel® SSD DC P4510 combines firmware enhancement with new 3D NAND features to prioritize host workload and ensure better service level agreement. The result: up to 10x improvement on 99.99% read latency improvement over previous generation 3D NAND based Intel Data Center SSDs.

Efficiently Manage at Scale

To help data centers make the most of increased SSD capacity per server, dynamic namespace management gives you the flexibility to enable more users and scale deployment. P4510 will also introduce the NVMe 1.2 security features secured platforms require.

With the capability to manage multiple firmware versions on a drive, and to update without a reset, P4510 improves integration and increases the ease and efficiency of deploying at scale.

Optimized QoS, Bandwidth, and Performance

With the increased density of Intel's 64-layer 3D NAND and enhanced firmware, the DC P4510 Series is built to handle read-intensive workloads and beyond. The DC P4510 Series creates greater quality of service, bandwidth, and performance to lead data centers through their evolving transformation.

Features At-a-Glance	
Model Name	Intel® Solid State Drive DC P4510 Series
Capacity	1, 2, 4, 8 TB
Performance[2], [3]	128k Sequential Read/Write – up to 3200/3000 MB/s
	Random 4K R/W: Up to 637K/139K IOPS
Reliability[1]	End-to-end data protection from silent data corruption, uncorrectable bit error rate < 1 sector per 10^{17} bits read
Interface	PCIe 3.1 x4, NVMe 1.2
Form Factor	U.2 2.5in x 15mm (for serviceability, hot-plug, and density)
Media	Intel® 3D NAND technology, 64-layer, TLC
Endurance	1 DWPD (JESD219 workload)
Power	62.4K IOPs/Watt
Warranty	5-year warranty

Learn more now at www.intel.com/ssd

1. Source - Intel. End-to-end data protection refers to the set of methods used to detect and correct the integrity of data across the full path as it is read or written between the host and the SSD controller and media. Test performed on Intel® SSD DC S3520 Series, Intel® SSD DC P3520, Intel® SSD DC P3510, Intel® SSD DC P4510 Series, Samsung* PM953, Samsung PM1725, Samsung PM961, Samsung PM863, Micron* 7100, Micron 510DC, Micron 9100, HGST* SN100, Seagate* 1200.2, SanDisk* CS ECO drives. Claim is based on average of Intel drive error rates vs. average of competitor drive error rates. Neutron radiation is used to determine silent data corruption rates and as a measure of overall end-to-end data protection effectiveness. Among the causes of data corruption in an SSD controller are ionizing radiation, signal noise and crosstalk, and SRAM instability. Silent errors were measured at run-time and at post-reboot after a drive "hang" by comparing expected data vs actual data returned by drive. The annual rate of data corruption was projected from the rate during accelerated testing divided by the acceleration of the beam (see JEDEC standard JESD89A).
2. IOPS Performance. Comparing 4K Random Write IOPS at queue depth 128, between Intel® SSD DC P4510 Series 1TB and Intel® SSD DC P4500 Series 1TB. FIO* was used with this configuration: Intel® Server Board S2600WTTR, Intel® Xeon® E5-2699 v3, Speed: 2.30GHz, Intel BIOS: Internal Release, DRAM: DDR3 – 32GB, OS: Linux* Centos* 7.0 kernel 4.8. Testing performed by Intel.
3. Performance per watt. Comparing Sequential Write bandwidth and power for 128KB transfer size with queue depth 128 between Intel® SSD DC P4510 Series 2TB and Intel® SSD DC P4500 Series 2TB. FIO* was used with this configuration: Intel® Server Board S2600WTTR, Intel® Xeon® E5-2699 v3, Speed: 2.30GHz, Intel BIOS: Internal Release, DRAM: DDR3 – 32GB, OS: Linux* Centos* 7.0 kernel 4.8. Testing performed by Intel.

Intel® technologies' features and benefits depend on system configuration and may require enabled hardware, software, or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer to learn more.

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