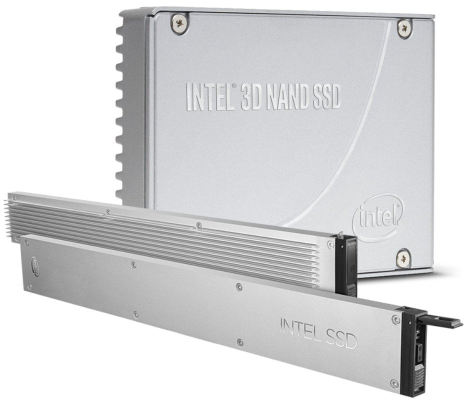
PRODUCT BRIEF

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

Cloud Inspired. Storage Optimized.

Designed to meet today's increasingly demanding service levels and support broader cloud workloads, while reducing storage costs.



Architected with 64-layer, Intel® 3D NAND technology, the Intel® SSD DC P4510 delivers performance, Quality of Service (QoS), and capacity to help optimize storage efficiency, enabling data centers to do more per server, minimize service disruptions, and efficiently manage at scale.

These PCIe SSDs are available in 1 TB, 2 TB, 4 TB, and 8 TB in the U.2 2.5" (15mm) form factor, and 15.36 TB in E1.L form factor.

Built for Cloud Storage Architectures

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 increases server agility and utilization, and accelerates applications.[1] Intel's 64-layer, 3D NAND technology offers increased density, the key to supporting broader workloads, allowing cloud service providers to increase users, and improve data service levels. Better QoS is ensured with an intelligent firmware algorithm that keeps host and background data read/write at an optimum balance.

Do More per Server

With the SSD DC P4510, host applications will not only have access to double the capacity, but will also be serviced at up to 80% faster write rate,[1] up to 2x better random write IOPS/TB[1], and up to 10x reduction of service time at a QoS metric of 99.99% availability for random access workload.[2,3]

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

Minimize Service Disruptions

To ensure telemetry information without disrupting ongoing I/Os, the SSD DC P4510 includes 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.

E1.L: The Shape of the Future

Intel® SSDs based on EDSFF were designed from the ground up for breakthrough efficiency. The E1.L form factor delivers higher capacity per drive and per server, with unparalleled thermal efficiency, more efficient management at scale, and flexible design options.

Coupled with industry-leading end-to-end data path protection scheme[4], PLI features enable ease of deployment into resilient data centers where data corruption from system-level glitches is not tolerated. The SSD DC P4510 combines firmware enhancements with 3D NAND features to prioritize host workload and meet service levels.

Efficiently Manage at Scale

To help data centers make the most of increased SSD capacity per server, dynamic namespace management delivers the flexibility to enable more users and scale deployment. The SSD DC P4510 also provides security features like TCG Opal 2.0 and built-in AES-XTS 256-bit encryption engine, required by some secure platforms.

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

Features At-a-Glance		
MODEL	**Intel® SSD DC P4510 U.2**	**Intel® SSD DC P4510 E1.L**
Capacity and Form Factor	U.2 2.5in x 15mm 1, 2, 4, 8 TB	E1.L 9.5mm and 18mm 15.36 TB
Interface	PCIe 3.1 x4, NVMe 1.2	PCIe 3.1 x4, NVMe 1.2
Media	Intel® 3D NAND technology, 64-layer, TLC	Intel® 3D NAND technology, 64-layer, TLC
Performance	128K Sequential Read/Write – up to 3200/3000 MB/s	128K Sequential Read/Write – up to 3100/3100 MB/s
	Random 4KB R/W: Up to 641.8K/134.5K IOPs	Random 4KB R/W: Up to 583.8K/131.4K IOPs
Reliability	UBER: 1 sector per 10^{17} bits read MTBF: 2 million hours	UBER: 1 sector per 10^{17} bits read MTBF: 2 million hours
Endurance	Up to 13.88 PBW	Up to 22.7 PBW
Power	Up to 16 Watt	Up to 16 Watt
Warranty	5-year warranty	5-year warranty

Learn more now at www.intel.com/ssd

1. Comparing the Intel® SSD DC P4510 to the Intel® SSD DC P4500. See SSD DC P4500 Product Brief: https://www.intel.com/content/www/us/en/products/docs/memory-storage/solid-state-drives/ssd-dc-p4500-brief.html
2. Source: Intel tested. Test and System Configuration: CPU: Intel® Xeon® CPU E5-2699 v4 @ 2.20GHz 55MB 22 Cores, CPU Sockets: 2, BIO: SE5C610.86B.01.01.0022.062820171903 (Intel Server Board S2600WT), RAM Capacity: 32G, RAM Model: DDR4-2137, RAM Stuffing: 1 of 4 Channels, DIMM Slots Populated: 4 Slots, PCIe Attach: CPU (not PCH lane attach), Chipset: Intel® C612 Chipset, Switch/ReTimer Model/Vendor: NA, OS: CentOS 7.3 1611, Kernel: 4.8.6, NVMe Driver: Kernel 4.8.6 (native), C-states: Disabled, Hyper Threading: Disabled, CPU Governor (through OS): Performance Model (Default Mode: Balanced). Some Results have been estimated or simulated using internal Intel analysis or architecture simulation or modeling, and provided to you for informational purposes. Latency. Source – Intel. Comparing 4KB Random Read queue depth 1 latency at 99.99%, between Intel® SSD DC P4510 Series 2TB , Intel® SSD DC P4500 Series 2TB. FIO was used with this config: Intel® Server Board S2600WTTR, Intel® Xeon® E5-2699 v4, Speed: 2.30GHz, Intel BIOS: Internal Release, DRAM: DDR4 - 32GB, OS: Linux Centos 7.2 kernel 4.8.6. SSD firmware version VDV10120. Testing performed by Intel.
3. 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. 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. 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).

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