

## PRODUCT BRIEF

Intel® SSD DC P4610/P4618  
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.**



Built from the success of its cloud-inspired predecessor—the Intel® SSD DC P4600—and architected with 64-layer TLC Intel® 3D NAND technology, the Intel® SSD DC P4610 and Intel® SSD DC P4618 deliver 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.

### An SSD 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 SSD DC P4610/P4618 meets the need to maximize efficiency, revitalize existing hardware, and accelerate applications across a wide range of cloud workloads, all while reducing operational costs.

### Do More per Server

Intel's 3D NAND technology enables the SSD DC P4610 to increase available capacity up to 20% more compared to its immediate predecessor, the SSD DC P4600.<sup>1</sup> This increased density is the key to supporting broader workloads, allowing cloud and enterprise 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 reads and writes at an optimum balance.

With the SSD DC P4610, host applications not only have access to higher capacity, but are also serviced at up to 35% faster write rate,<sup>2</sup> up to 35% more endurance per drive,<sup>3</sup> and up to 4x reduction of service time at a QoS metric of 99.99% availability for random access workload.<sup>4</sup>

With the SSD DC P4618, write bandwidth is doubled and endurance is increased 50% over Intel® SSD DC P4608.<sup>2,3</sup>

### Minimize Service Disruptions

To ensure telemetry information without disrupting ongoing I/Os, the SSD DC P4610/P4618 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.

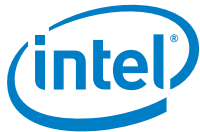
Coupled with our industry-leading end-to-end data path protection scheme, PLI features enable ease of deployment into resilient data centers where data corruption from system-level glitches is not tolerated.<sup>5</sup> The SSD DC P4610/P4618 combines firmware enhancements with new 3D NAND features to prioritize host workload and ensure better 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 P4610 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 P4610 improves integration and increases the ease and efficiency of deploying at scale.

| Features At-a-Glance     | SSD DC P4610   | SSD DC P4618   |
|--------------------------|--|--|
| Model                    | Intel® Solid State Drive DC P4610 Series   | Intel® Solid State Drive DC P4618 Series   |
| Capacity                 | 1.6 TB, 3.2 TB, 6.4 TB, and 7.68 TB  | 6.4 TB   |
| Performance <sup>6</sup> | 128k Sequential Read/Write – up to 3200/3200 MB/s<br>Random 4KB R/W: Up to 654K/220K IOPs                                      | 128k Sequential Read/Write – up to 6650/5350 MB/s<br>Random 4KB R/W: Up to 1210K/484.5K IOPs                                   |
| Reliability <sup>5</sup> | End-to-end data protection from silent data corruption, uncorrectable bit error rate < 1 sector per 10 <sup>17</sup> bits read | End-to-end data protection from silent data corruption, uncorrectable bit error rate < 1 sector per 10 <sup>17</sup> bits read |
| Interface                | PCIe 3.1 x4, NVMe 1.2  | PCIe 3.1 x8, NVMe 1.2  |
| Form Factor              | U.2 2.5in x 15mm (for serviceability, hot-plug, and density)   | HHHL Add-in Card   |
| Media                    | Intel® 3D NAND technology, 64-layer, TLC   | Intel® 3D NAND technology, 64-layer, TLC   |
| Endurance                | Up to 3 DDPD (JESD219 workload)  | Up to 4.56 DDPD (JESD219 workload)   |
| Power <sup>7</sup>       | Up to 15 Watt  | Up to 29 Watt  |
| Warranty                 | 5-year limited warranty  | 5-year limited warranty  |



Learn more now at [www.intel.com/ssd](http://www.intel.com/ssd)

Intel® SSD DC P4608 Source: <https://ark.intel.com/content/www/us/en/ark/products/96958/intel-ssd-dc-p4608-series-6-4tb-1-2-height-pcie-3-1-x8-3d1-tlc.html>

Intel® SSD DC P4600 Source: <https://www.intel.com/content/dam/www/public/us/en/documents/product-briefs/ssd-dc-p4600-brief.pdf>

1. Comparing Intel® SSD DC P4610 Series 7.68 TB and Intel® SSD DC P4600 Series 6.4 TB.
2. Comparing 128KB Sequential Write Bandwidth at queue depth 128, between Intel® SSD DC P4610 Series 6.4 TB and Intel® SSD DC P4600 Series 6.4 TB. Measured bandwidth was 3.04 GB/sec and 2.2 GB/sec on Intel® SSD DC P4610 and P4600 Series respectively. Measured write bandwidth for Intel® DC P4618 6.4 TB and Intel® DC P4608 6.4 TB are 5.3 GB/sec and 2.5 GB/sec respectively for 30W mode.
3. Comparing JEDEC enterprise workload endurance between Intel® SSD DC P4610 Series 6.4 TB and Intel® SSD DC P4600 Series 6.4 TB and between Intel SSD DC P4618 6.4 TB and Intel SSD DC P4608 6.4 TB.
4. Intel Test: Comparing 4KB Random Read and 70/30 Random Read/Write queue depth 1 latency at 99.99% percentile, between Intel® SSD DC P4610 Series 6.4 TB and Intel® SSD DC P4600 Series 6.4 TB. For example, measured latency for 99.99% was 0.72ms and 3.13ms for Intel® SSD DC P4610 and P4600 Series, respectively. Results have been measured for 15min run for all capacities. Any differences in your system hardware, software or configuration may affect your actual performance. Intel expects to see certain level of variation in data measurement across multiple drives. FIO\* uses the configuration listed on footnote 6.
5. 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). Performance results are based on testing as of May 2019 and may not reflect all publicly available security updates. See configuration disclosure for details. No product or component can be absolutely secure.
6. Test and System Configuration: Processor: Intel® Xeon® Gold 6140 CPU @ 2.30 GHz, DRAM: DDR4 – 32 GB, OS: Linux® CentOS® 7.3 kernel 4.8.6/4.15.rc1, Intel® SSD DC P4610 Series, firmware version VDV10140. Intel BIOS Patch rev13 was used (<https://ark.intel.com/products/89010/Intel-Server-System-R2208WFTZS>).
7. Average power for Intel® SSD DC P4618 firmware VDV10160 measured by sequential write workload with transfer size of 128KB and queue depth of 128. FIO\* uses the configuration listed in footnote 6.

† All manageability features are not available at the time of the product release but will be available in future maintenance release. Please refer to product specification for details about feature description and availability.

Software and workloads 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](http://www.intel.com/benchmarks).

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