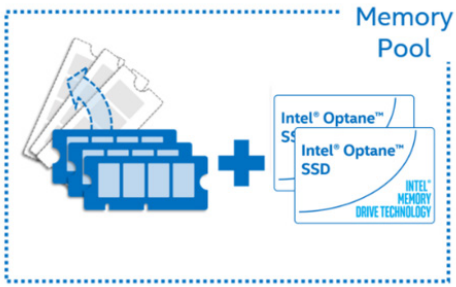
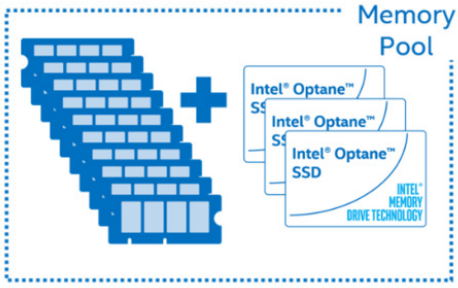
TECHNOLOGY BRIEF

Intel® Optane™ SSD DC P4800X/P4801X and Intel® Optane™ SSD 900P/905P with Intel® Memory Drive Technology
Data Center

Enabling Bigger, More Affordable Memory Solutions

Intel® Memory Drive Technology transparently integrates Intel® Optane™ SSDs into the memory subsystem.





Intel® Memory Drive Technology can revolutionize your data center memory architecture. When combined with Intel® Optane™ SSDs, Intel® Memory Drive Technology transparently integrates the drive into the memory subsystem and makes it appear like DRAM to the operating system and applications. This can increase memory capacity beyond DRAM limitations, with no change required to the OS or applications.

Intel® Memory Drive Technology is highly beneficial in two primary IT scenarios:

- Displace a portion of more expensive DRAM to reduce overall memory cost
- Grow the memory pool beyond DRAM capacities to access or enable much larger memory datasets

Displace Costly DRAM for More Affordable Memory

Intel® Memory Drive Technology enables data centers to deliver more affordable memory pools by displacing a portion of higher cost, higher power DRAM. By pairing a reduced amount of DRAM and replacing that capacity with the high-performing non-volatile memory of the Intel® Optane™ SSD DC P4800X, data centers can more cost-effectively execute memory-intensive workloads with much lower DRAM capacity installed, saving on both hardware procurement and operations cost.

Extend Memory for a Bigger Memory Footprint

Intel® Memory Drive Technology enables data centers to grow the memory footprint beyond DRAM-only capacity. Together, DRAM and Intel® Optane™ SSDs with Intel® Memory Drive Technology emulate a single volatile memory pool. Additionally, Intel® Memory Drive Technology intelligently determines where data should be located within the pool to maximize speed, enabling servers to deliver performance across many workloads—even when DRAM is only supplying one-third to one-eighth of the memory pool capacity.

Enable New Possibilities for the Enterprise

The combination of cost-efficiency and increased capacity means enterprises can break through today's memory limits, enabling new possibilities—like accessing higher-capacity, in-memory datasets to deliver better, faster analytics insight. As an example, cloud providers can reduce capital cost for memory when enabled to oversubscribe workloads with greater overall capacity. Or, high-performance computing centers can increase large memory datasets to improve research and scientific results, and test new simulations quickly and cost-efficiently.

About Intel® Optane™ Technology

Intel® Optane™ technology is a unique combination of Intel® Optane™ media with Intel's advanced system memory controller, interface hardware and software IP. This revolutionary technology is offered in several form factors to unleash vast system performance in a range of products.

HARDWARE REQUIREMENTS	
Intel® Optane™ SSD DC P4800X/P4801X Intel® Optane™ SSD 900P/905P	100GB, 375GB, 750GB, 1.5TB[1,2] 280GB, 380GB, 480GB, 960GB, 1.5TB
Supported Processors	Intel® Xeon® Scalable, Intel® Xeon® E5-x6xx v2 or later, E7-x8xx v2 or later; IntelXeon D, Intel Xeon E; Intel® Core™ i7-98xx, i7-78xx, Intel® Core™ i9-99xx, i9-98xx, i9-79xx
Maximum Processor Sockets	16
Operating Systems	RHEL / Centos 6.5, 6.6, 6.7, 6.8 ,7.0, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 8.0 SLES 11 SP4, 12, 12 SP1, 12 SP2, 15 Ubuntu 16.04-19.10 Intel® Memory Drive Technology Software[3] requires a bootable media[4] Supported protocols: IDE, UHCI, EHCI

SOFTWARE FEATURE	SPECIFICATIONS
Memory Capacity	85GiB, 240GiB, 320GiB, 400GiB, 640GiB, 800GiB, 1.28TiB[1,2]
Maximum Software-defined Memory	64TiB[1]
Recommended DRAM Expansion	Up to 8x[5]
Memory Media Mode	Volatile (non-persistent)

For more information, visit intel.com/ssd

1. GB = 1,073,741,824 bytes, TB = 1,099,511,627,776 bytes
2. Total physical capacity is 375GB, 750GB, and 1500GB. Total usable capacity towards Intel® Memory Drive Technology is 320 GB. 640GB, 1280GB
3. Technology licensed from ScaleMP*
4. Software boots from USB media, network image (PXE boot) or directly from Optane SSD in UEFI mode.
5. For example: 128GB DRAM can be expanded up to 1024GB based on the capacity of the non-volatile memory media installed. Higher expansion ratios may be supported, with possibly suboptimal performance.

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.

Performance results are based on testing as of July 5, 2018 and may not reflect all publicly available security updates. See configuration disclosure for details. No product can be absolutely secure.

Your costs and results may vary.

Results have been estimated or simulated.

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

Intel disclaims all express and implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement, as well as any warranty arising from course of performance, course of dealing, or usage in trade.

The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.