

GENERAL INFORMATION

Q1: What is Intel® Optane™ memory, and why is it called memory?

A: Intel® Optane™ memory is a system acceleration solution for new 7th Gen Intel® Core™ processor platforms. This solution comes in a module format and uses Intel® Optane™ technology, based on 3D XPoint™ memory media along with the Intel® Rapid Storage Technology (Intel® RST) driver. By placing this new memory media between the processor and slower SATA-based storage devices (HDD, SSHD or SATA SSD), we are able to store commonly used data and programs closer to the processor, which allows the system to access this information more quickly and improve overall system responsiveness.

Q2: What is system acceleration? What is system responsiveness? Will Intel® Optane™ memory make my PC feel faster?

A: System acceleration refers to the effect that Intel® Optane™ memory has on a computer. It enables tasks to be completed faster and reduces the wait time experienced by the user. Responsiveness refers to how quickly the end user requests are completed – PCs with Intel® Optane™ memory will start/ boot quicker, search and find files faster, save large files faster, launch applications faster, and multitask between application seamlessly. Yes, Intel® Optane™ memory will make the PC feel faster/ most responsive/ accelerated.

Q3: What is the difference between Intel® Optane™ Memory and DRAM? Does it replace DRAM?

A: The Intel® Optane™ memory module does not replace DRAM so, for example, if a game requires 8GB of DRAM, you can't use 4GB of DRAM and 16GB of Intel® Optane™ memory to meet the game requirement. DRAM continues to be needed for regular PC functioning.

Q4: Will Intel® Optane™ memory also accelerate an SSD? If so how much?

A: Yes. Intel® Optane™ memory can be used to accelerate any type of SATA-based storage media, including SATA SSDs. However, the performance benefit of adding Intel® Optane™ memory will be greater on slower storage devices like an HDD versus a relatively faster storage device like a SATA-SSD.

Q6: How is Intel® Optane™ memory different from other NAND caching and caching solutions?

A: This is a brand new technology that was built from the ground up to address the need for non-volatile, high-performance, high-endurance, low latency and Quality of Service (QoS). The combination of these attributes in a memory technology in production sets it apart from anything else.

Intel® Optane™ memory is different from other NAND caching solutions for the following reasons:

- Revolutionary, new 3D XPoint™ memory media performs well even in low capacities (16GB) and has the necessary endurance to withstand multiple reads and writes to the module.
- Leading edge algorithm in the Intel® Rapid Storage Technology driver creates a compelling high performance solution
- User -friendly, intuitive installation and easy to use set-up process – automatically configures solution to match your needs

HOW DO I GET IT?

Q1: Do I need to buy a new PC to use Intel® Optane™ memory? If so, what are the minimum specs for what I need?

A: For Intel® Optane™ memory to be supported, a PC needs to have a 7th Gen Intel® Core™ processor, an Intel® 200 series chipset, an M.2 type 2280-S1-B-M connector on a PCH Remapped PCIe Controller and Lanes in a x2 or x4 configuration with B-M keys that meet NVMe Spec 1.1, System BIOS that supports the Intel® Rapid Storage Technology (Intel® RST) 15.5 or later driver and Windows* 10 64bit or above installed on a supported SATA-based storage device (Hard drive, SATA SSD or SSHD). Please see intel.com/optane memory for additional details.

Note: The SATA-based storage device must have Windows 10 64bit installed, be formatted for GPT partition and have at least 5MB of continuous unallocated space at the end of the boot volume. Additionally, you will need to download the most recent Intel® Rapid Storage Technology 15.5 or later driver available at downloadcenter.intel.com, to use Intel® Optane™ memory modules as a system accelerator.*

Q2: What does Intel® Optane™ memory ready mean? How do I know if my PC can use Intel® Optane™ memory?

A: Intel® Optane™ memory ready means the system or motherboard meets the minimum hardware specifications required for Intel® Optane™ memory, including an 7th generation Intel® Core™ processor, an Intel® 200 series chipset, an M.2 type 2280-S1-B-M connector on a PCH Remapped PCIe* Controller and Lanes in a x2 or x4 configuration with B-M keys that meet NVMe* Spec 1.1. Many systems will have the designation “Intel® Optane™ memory ready” indicating they have are ready to accept the module.

Note: Some systems and motherboards may require a BIOS update before the Intel® Optane™ memory SW/driver package can be installed. Consult your Motherboard vendor's support website for the latest Intel® Optane™ memory supported BIOS.

Q3: Can I use Intel® Optane™ memory in a notebook or laptop?

A: Initially, Intel® Optane™ memory is targeted for desktop PC usage. Notebook and mobile systems featuring Intel® Optane™ memory will be available at a later date.

Q4: What Operating Systems does Intel® Optane™ Memory support when used for System Acceleration?

A: Microsoft Windows 10 64bit is required for Intel® Optane™ Memory to be used as a System Accelerator.

PERFORMANCE DETAILS

Q1: Why should I choose to buy Intel® Optane™ memory instead of a low-cost SSD?

A: Customers have choices based upon their own requirements. Typically for those customer who need high capacity storage, they chose an HDD. “Low-cost SSD’s” are often lower capacity. Paired with an HDD, Intel® Optane™ memory delivers increased responsiveness with the often high capacity of an HDD.

Q2: Why would I need 32GB capacity instead of 16GB? What is the difference in performance? Which capacity should I buy?

A: The main difference between the 32GB and 16GB modules is the number of applications that can be accelerated. The 16GB capacity is adequate for normal mainstream usage, but the 32GB module is ideal for power users who often use a variety of data intensive applications, such as prosumers and gamers. The 16GB capacity is adequate for normal mainstream usage. The 32GB module will be needed for power users who often use a variety of data intensive applications (for example a user who plays multiple games commonly).

Q3: What number of times does an app have to launch or a file have to be opened until it get the full acceleration from Intel® Optane™ memory kicked in?

A: The second time an application is launched or a file is used, it is accelerated and the user will experience the vast majority of the benefit. On the third run is technically when the full benefit kicks in. Note: Intel® Optane™ memory prioritizes frequently used files and applications for acceleration. Thus, infrequently used files and applications may fall out of the cache overtime.

GAMING PERFORMANCE

Q1 : How many games can I accelerate with the 16GB?

A: You cannot quantify the number of games or applications that can be accelerated as this is highly dependent on the size and architecture of the software, other software and usage patterns on your system, and specific platform configuration.

Q2: Games tend to occupy several 10s of GB of space, how does a 16GB module accelerate an entire game? Will gameplay be affected due to the smaller size of the module relative to the game size?

A: On the first attempt at launching the game, the Intel® Rapid Storage Technology driver detects the specific files used during launch and accelerates these files accordingly during subsequent launches. Even though games may occupy many GBs of space, most of it may not be needed for immediate gameplay. Gameplay will not be affected due to the module size. When playing multiple games, Intel recommends higher capacity options like 32GB. **Note: Intel® Optane™ memory prioritizes frequently used files and applications for acceleration. Thus, infrequently used files and applications may fall out of the cache overtime.**

Q3: If I use a 16GB module and an HDD to accelerate my game, I understand game launch and level loads become faster or close to that of an SSD only experience, but what about game play? Is game play impacted?

A: Most games will not see a significant performance enhancement during gameplay as game data is loaded into DRAM during game play.

1. SYSmark* 2014 SE (Responsiveness Subscore) - benchmark from the BAPCo* consortium that measures the performance of Windows* platforms. SYSmark* tests four usage scenarios: Office Productivity, Media Creation, Data/Financial Analysis, and Responsiveness. SYSmark* contains real applications from Independent Software Vendors such as Microsoft* and Adobe*.

3. Browser Launch Workload – Workload developed by Intel® measuring the time elapsed to launch Google* Chrome

4. OS Load Time Workload – Workload developed by Intel® measuring the time elapsed from initiating power-on (from powered-off state) until the operating system has completed loading

5. Game Launch & Level Load Workload – Workload developed by Intel® measuring the time elapsed to launch Bethesda Softworks* Fallout 4 and reach the Main Menu with intro videos disabled (Launch), and the time elapsed from the Main Menu to completion of level loading (Level Load)

6. Email Launch Workload – Workload developed by Intel® measuring the time elapsed to launch Microsoft* Outlook 2016 and load with a 250mb local data file

7. File Search Workload – Workload developed by Intel® measuring the time elapsed using Microsoft* Windows File Search to locate a specified file in a non-indexed directory

8. Presentation Launch Workload – Time elapsed to launch the Microsoft* Powerpoint 2016 application with a 3.5MB presentation file

9. Media Project Load Workload – Time elapsed to load a 500MB video project file in Adobe* Premiere Pro (CS6)

10. Tested on Intel® Core™ i5-7500 Processor, 65W TDP, 4C4T, Turbo up to 3.8GHz, Memory: 2x4GB DDR4-2400, Storage: Western Digital* 1TB 7200RPM WD1003FZEX, Intel HD Graphics 630, OS: Windows* 10 as measured against the same system with a 16GB Intel® Optane™ memory module

11. Tested with 16GB Intel® Optane™ Memory Engineering Samples. Results may vary in final product, but we have a high confidence level that there will be no significant differences in performance.

12. Gaming workloads were tested with same configuration, except using a discrete graphics card (NVIDIA* (EVGA) GTX 1080) with and without 16GB Intel® Optane™ Memory Module

13. 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 information, go to www.intel.com/benchmarks.

*Other names and brands may be claimed as property of others.

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