Breakthrough Performance with SUSE Enterprise Storage, Intel Cache Acceleration Software and Intel Data Center SSDs

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Intel® Cache Acceleration Software (CAS) in conjunction with Intel® Data Center (DC) SSDs is a high-performance solution that can accelerate applications without modification to these applications or to the existing back-end storage media. Intel® CAS provides unique features tuned specifically for Intel® DC SSDs, enabling applications to utilize the SSD for caching the prioritized data from existing back-end storage media (e.g. HDD, SAN). The Intel DC SSDs in combination with Intel CAS is a cost-effective hybrid solution that can quickly and easily provide a boost to read and write performance without introducing additional operational costs.

The improved performance and cost savings is especially beneficial with software-defined storage solutions such as SUSE Enterprise Storage. That's why Intel and SUSE have partnered on a more cost effective storage solution that provides enhanced performance to joint customers such as the University of British Columbia (UBC) in Vancouver, Canada.

UBC is expanding their genomics research project which required significantly growing their existing storage arrays. Instead of doing a costly forklift upgrade of their existing traditional storage array, they wanted a solution that was easy to manage and grow, and that maintained the existing level of user SLAs while keeping costs down. A collaborative effort utilizing SUSE Enterprise Storage 4 with Intel DC SSDs and Intel CAS resulted in a high performance architecture that takes advantage of Intel and SUSE technologies to implement a solution which exceeds their customer SLAs.

The Intel and SUSE solution allowed UBC to overcome the challenges of a traditional array-based solution that is difficult to scale and expensive in terms of capital cost and maintenance, by moving to a software-defined storage solution that can easily scale out and scale up while lowering purchase and expansion costs.

Intel CAS Benefits

Intel CAS is installed as a loadable kernel module with a user space admin tool provided for configuration and management. It is deployed at the block layer and once configured, CAS watches the I/O coming to the hard drives and caches that I/O to the faster Solid State Drives. When this data is accessed again by the application or OS, it will be returned by Intel CAS from the much faster SSD instead of from the hard drive, improving application performance without any modifications to the application. Intel CAS and DC SSDs can greatly improve the I/O performance of workloads especially when used with a software-defined storage solution such as SUSE Enterprise Storage. The figure below shows where Intel CAS fits within a SUSE Enterprise Storage cluster.
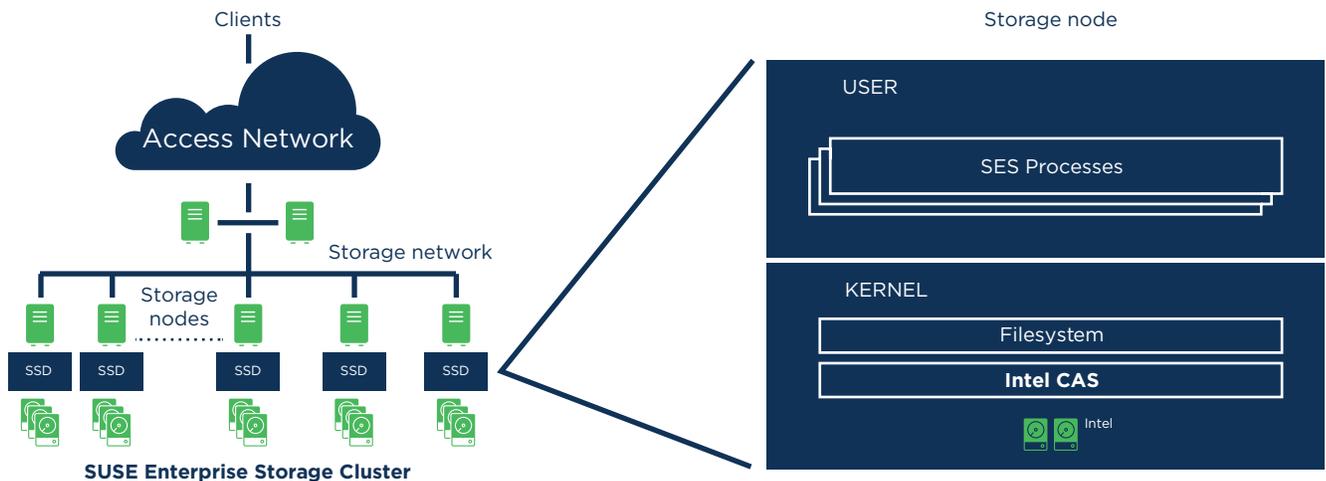
Unlike conventional and less effective "least recently used" (LRU) caching techniques, Intel CAS has an intelligent classification-based solution called I/O Classification that prioritizes I/O in the cache. Because of this intelligence, Intel CAS can identify the data types that lead to bottlenecks. CAS I/O Classification enables customers to assign policies and set priorities for their specific I/O data patterns at a finer level of granularity than ever before, allowing them to better tune their environment for their specific applications and to gain optimal performance.

Intel CAS takes advantage of Intel DC SSD technologies to improve the performance of application I/O. Intel CAS has a small default memory footprint that can be further reduced by using a feature called Selectable Cache Line Size, which reduces the need for costly DRAM, thus providing cost saving benefits especially as servers move to higher capacity storage. Other features, such as In-Flight Upgradability and improved integration with SUSE Enterprise Storage, powered by Ceph technology, allow users to upgrade Intel CAS without I/O interruption, providing further operational efficiencies.

SUSE Enterprise Storage Benefits

SUSE Enterprise Storage is an intelligent software-defined storage management solution, powered by Ceph technology, which enables IT to transform their enterprise storage infrastructure to deliver highly scalable and resilient storage that is cost-efficient and able to seamlessly adapt to changing business and data demands.

SUSE Enterprise Storage delivers a highly scalable and resilient storage environment with a single unified software-defined storage cluster that provides applications with object, block and file system storage:

- Unlimited scalability with a distributed storage cluster designed to scale to multi-hundreds of petabyte environments and beyond
- No single points of failure with a highly redundant storage infrastructure design that maximizes system resiliency and availability
- Maximize application availability following hardware failures with self-healing capabilities that minimize storage administration involvement and optimize data placement enabling rapid reconstruction of redundancy
- Provides all of the storage services expected of an enterprise grade storage solution

SUSE Enterprise Storage reduces IT costs with an intelligent software-defined storage management solution that uses commodity off-the-shelf servers and disk drives

- Significant CAPEX savings using commodity hardware that is at least 30 percent less expensive than average capacity optimized NAS solutions and at least 50 percent less expensive than deploying the average capacity-optimized mid-range disk array
- Reduce IT operational expense with a single storage management tool managing a single storage cluster for your heterogeneous server environment (Linux, UNIX, Windows, VMware)
- Optimize infrastructure without growing IT staff with an easy to manage intelligent solution that continuously monitors data utilization and automatically re-balances data placement without any manual intervention
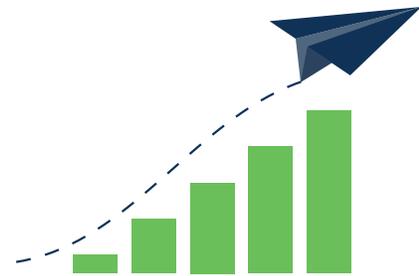
Intel CAS is now available through SUSE Solid Driver Program

Intel in partnership with SUSE is providing Intel CAS through the SUSE Solid Driver Program which removes the complexities and risks associated with deploying required kernel drivers, and gives customers an easy way to identify fully compatible and supported software code. Intel CAS combined with Intel DC SSDs can improve performance and user experience when used with SUSE Enterprise Storage.

In addition, Intel and SUSE are working on interoperability between Intel CAS with SUSE Enterprise Storage 5 and further enhancing the performance of the new Ceph BlueStore functionality. BlueStore is a new storage backend for Ceph that operates close to the hardware, thus eliminating the abstraction layers associated with POSIX filesystem operations. Early testing indicated that BlueStore will improve write speeds by up to a factor of two over previous versions, although the actual number could vary depending on your hardware and your Ceph configuration.

SUSE Solid Driver

For more information, contact your local SUSE Solutions Provider, visit us online or call SUSE at:

1-800-796-3700 (U.S. and Canada)
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