

SOLUTION BRIEF

Reduce SAP HANA® TCO with DirectMemory™ Cache from Pure Storage®

The SAP HANA platform is a key technology for many enterprises, allowing them to boost performance and drive business innovation. One key to the power of SAP HANA is its ability to process large databases in memory. But as data sets grow immense, the need for enormous memory to process the data becomes prohibitively expensive. SAP HANA Native Storage Extension (NSE) is a powerful, built-in option for accessing infrequently used data directly from storage. This storage needs to be as fast as possible to reduce the performance penalty when accessing warm data. Pure Storage DirectMemory Cache provides near-DRAM speeds at significant cost savings compared to an all-DRAM implementation.¹

In an SAP HANA environment, databases that grow too large can become a significant cost issue—both for hardware and for licensing—when tremendous amounts of memory are required to process the data. The alternative is to offload up to 80% of the data to warm storage using SAP HANA NSE. SAP HANA NSE is an intelligent built-in disk extension for the SAP HANA in-memory database. With SAP HANA NSE, there is no need to move data: warm data is accessed from disk rather than from memory but at near-memory speeds. This approach can reduce your memory footprint, which can help substantially reduce costs. Because SAP HANA is often licensed by the amount of data in-memory, SAP HANA NSE can also help dramatically reduce the cost of your database license.

**Reduce Costs**

Reduce costs up to 65% compared to in-memory¹

**Storage-Class Memory**

Near DRAM levels of performance

**Perfect for
SAP HANA NSE**

Maximizes the performance of SAP HANA Native Storage Extension (NSE)

Introducing DirectMemory Cache

Pure Storage offers a solution to take full advantage of the cost benefits of SAP HANA NSE while keeping performance at a high level. With DirectMemory Cache from Pure, you can easily lower your total cost of ownership (TCO) due to the need for fewer SAP HANA licenses, in addition to needing smaller amounts of expensive DRAM.¹ At the same time, you can maintain performance similar to a DRAM-only configuration, because DirectMemory Cache is built on technology that is nearly as fast as DRAM.

Storage-class memory (SCM) is a new class of memory technology that bridges the performance gap between DRAM and flash solid-state disks (SSDs), with latency measured in the tens of microseconds (compared to hundreds of nanoseconds for DRAM and hundreds of microseconds for flash drives). SCM is persistent, has higher density, and is less costly than DRAM.

Pure Storage's SCM implementation is called DirectMemory Cache. DirectMemory Cache is the first SCM of its kind, based on Intel Optane technology. It is a non-volatile memory cache inside FlashArray™ products that offers a new way of balancing performance and cost. Composed of Intel Optane SSDs, DirectMemory Cache delivers exceptional performance for warm data with SAP HANA NSE.

Resolve the Cost-Performance Dilemma

As an SAP HANA administrator, you have a choice. You can pay a lot for a large system with a significant amount of memory, or you can implement warm data management to reduce the costs of ever-growing data. DirectMemory Cache is a cost-effective way to implement warm data management with high performance. It enables you to:¹

- Reduce the memory required for SAP HANA by up to 8x
- Reduce the TCO of hardware and software provisioning
- Use cost-effective warm data with extremely low latency

Pure for SAP HANA

Deploying SAP HANA on traditional storage can often lead to complex, inefficient, and costly operational models. Pure's FlashArray innovation can help improve the return on investment (ROI) for your most valuable IT investment, SAP, to deliver a Modern Data Experience™ by:

- Improving performance and data management
- Simplifying migration to hybrid-cloud landscapes
- Automating complex, time-consuming operations
- Protecting your mission-critical data in real time
- Delivering a true utility model with the Pure as-a-Service™ platform

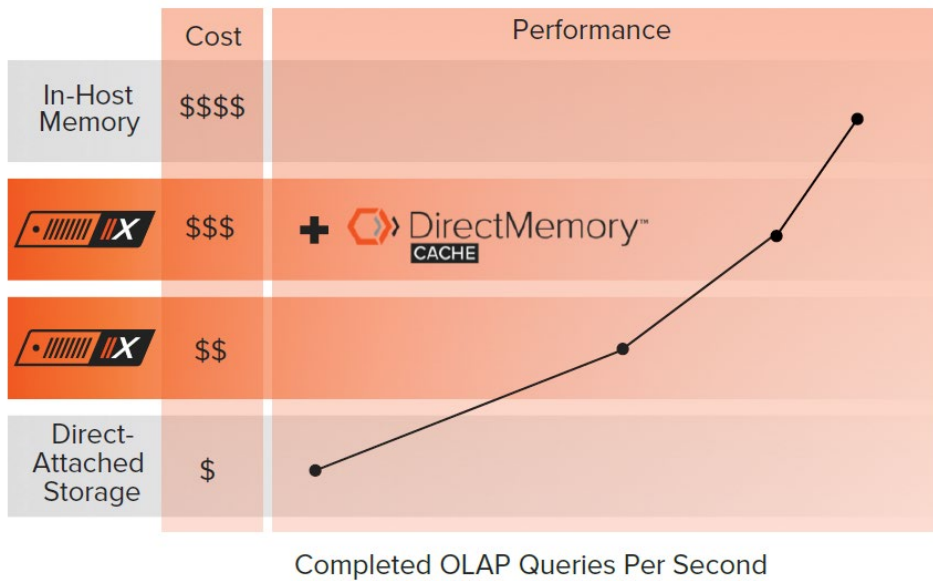


Figure 1. DirectMemory Cache with SAP HANA NSE creates a sweet spot of high performance without the high price.

A Better Way to Support Larger Databases

With SAP HANA NSE, you can expand SAP HANA database capacity with warm data on disk by up to four times the size of hot data in memory. Because the buffer cache can easily handle eight times its size of warm data on disk, it requires only a small amount of SAP HANA memory for the SAP HANA NSE buffer cache for common paging operations.¹

Figure 2 shows two different ways to expand SAP HANA data capacity. At the top, the diagram shows an SAP HANA configuration with 2TB DRAM, which allows a 1TB database size (because SAP HANA requires half the memory for working space). Suppose you want to support a 4TB database size instead. Figure 2 shows two different ways to accomplish that.

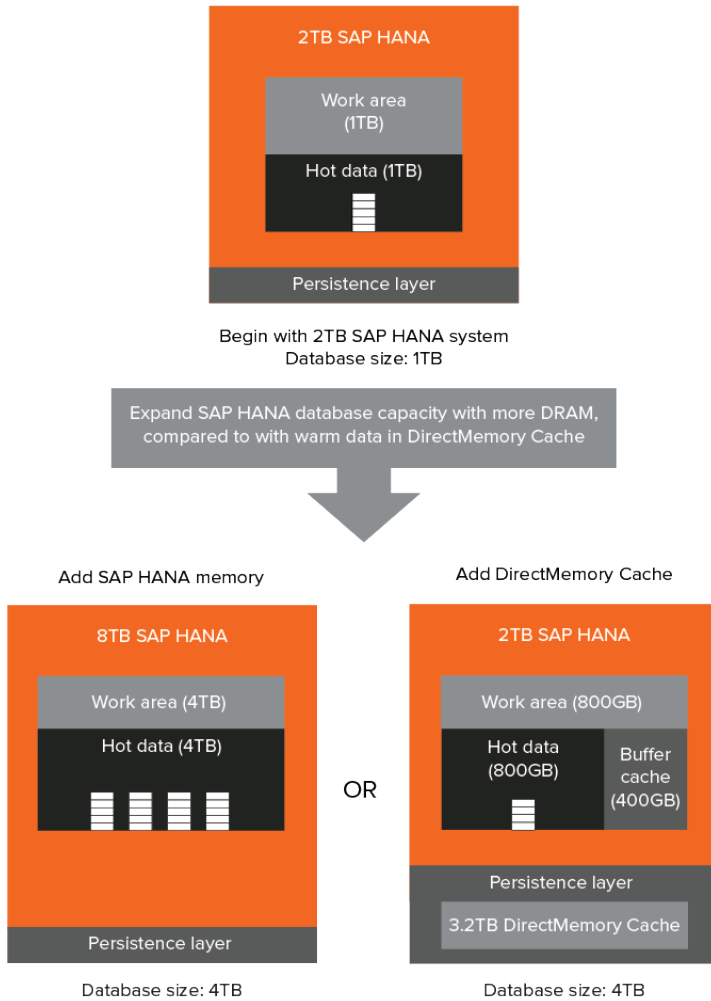


Figure 2. Two ways to expand SAP HANA data capacity.

One simple but expensive way to expand data capacity to 4TB is to add 6TB of extra DRAM, for a total of 8TB—the amount needed to support a 4TB database entirely in memory. Nothing can match the performance of putting all your data in DRAM, but that comes with a premium price tag for hardware and additional SAP HANA licenses.

Another option is to add just 3.2TB of DirectMemory Cache to hold SAP HANA NSE warm data. In this case, a 400GB buffer cache is allocated from existing memory to support the 3.2TB of warm data. The result is 800GB of hot data plus 3.2TB of warm data for a total database size of 4TB.

What is the performance penalty for using a warm data cache instead of DRAM? To find out, Pure ran a test. We measured online analytical processing (OLAP) queries per second on a FlashArray solution using DirectMemory Cache. The result: We achieved 90% of the performance of an in-memory configuration. Your results might vary, of course, but our testing showed a very small performance penalty for an option that could save more than half the total cost of an all-DRAM configuration.¹



DirectMemory Cache fills the performance and cost gap between NAND SSDs and DRAM, and it promises to revolutionize data center architecture. It enables you to cost-effectively work with larger data sets by creating a new, higher-performing tier for warm data.

Explore Your Options for Fast Access to More Data

With DirectMemory Cache, Pure Storage FlashArray delivers a high performing solution for SAP HANA NSE that helps you get the most from your SAP HANA implementations.

Call your Pure Storage representative today to learn how DirectMemory Cache can help you get the most from your data and the most value from your SAP HANA deployment.

¹ Based on internal Pure Storage testing and analysis. Your results may vary as differences in system configuration might affect actual performance.

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