

# SAP HANA Native Storage Extensions (NSE) implemented with Dell PowerStore storage

Achieve dramatic SAP cost savings with the power of Dell PowerStore, Intel Optane NVMe, and SAP HANA NSE

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## Business challenge

Many SAP customers experience exponential data growth, and the cost of ownership increases rapidly with the size of their SAP HANA database. Familiar challenges of a healthy business using SAP HANA include:

- SAP licenses based on memory that is used in production can be greater than hardware costs.
- Customers with large databases cannot build large enough systems that are in-memory only.
- Customer database growth is outgrowing their current SAP HANA servers' memory.

## Solution overview

NSE reduces the memory footprint of the SAP HANA database with expanded disk capacity and an intelligent buffer that transfers pages of data between memory and PowerStore storage. SAP HANA NSE on PowerStore with Intel Optane NVMe is a new implementation of a proven SAP technology that provides outstanding performance, economical scalability, and enormous cost savings as data grows.

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**Note:** NSE storage access patterns are significantly different to standard SAP patterns. The ability of PowerStore storage to use Optane NVMe drives as capacity drives differentiates this solution, yielding near in-memory speeds for queries that are pulled from the PowerStore server. PowerStore storage is currently the only storage subsystem on the market with this capability.

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The SAP HANA NSE solution provides data-tiering options. “Hot data” in this solution refers to “column-loadable” data that resides in-memory. NSE enables customers to refine their use of in-memory storage to achieve best use of the more costly memory assets for the hot data.

## Essentials

SAP HANA NSE is available at SP HANA 2.0 SPS 04 and later versions.

“Warm data” in this solution is less frequently accessed data. Users can specify warm data as “page-loadable.” This data is loaded into memory page by page as required for query processing. The page-loadable data is not required to reside in-memory in the same way as column-loadable data; instead, this data is stored exclusively on PowerStore storage with Intel Optane NVMe drives.

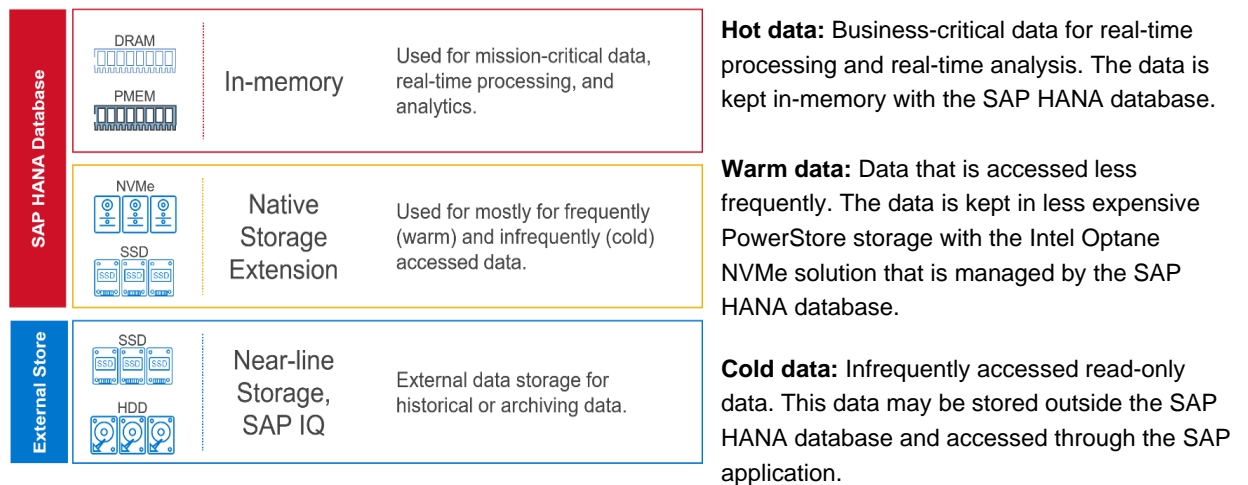
## Benefits

SAP HANA NSE adds a native warm-data tier to the SAP HANA database. The database capacity may be maintained at a lower Total Cost of Ownership (TCO), using a simple and scalable landscape that continues to offer impressive performance. NSE supports full SAP HANA functionality and all SAP HANA datatype and data models. The resulting benefits include:

- Availability of more SAP HANA data without the expense of memory growth.
- Mitigation of increased licensing costs caused by memory growth.
- Extension of the life of the server by keeping memory sizing consistent.
- Addition of warm storage data in-memory to warm data on disk, up to a 1:4 ratio of SAP HANA hot data. The NSE disk capacity available with the PowerStore solution is 10 TB.

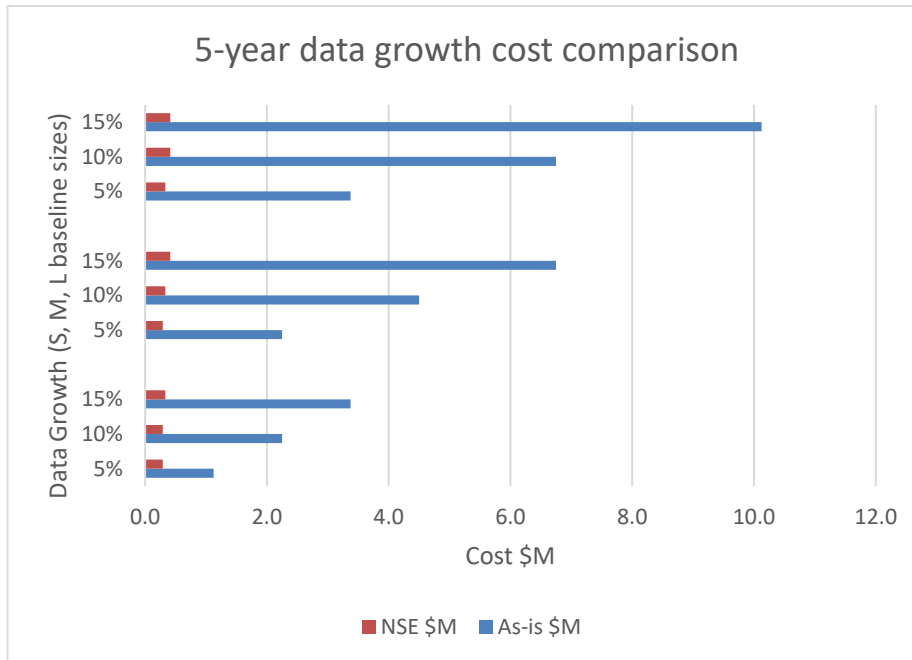
## Technology overview

The following diagram shows the placement of data by storage options:



## Cost savings

The following cost comparison chart shows groupings of three memory baseline sizes: small (6 TB), medium (12 TB), and large (18 TB). Three data growth rates are applied to each baseline over a five-year period. The one-time cost of the PowerStore and Intel Optane NVMe solution is included in the NSE cost.



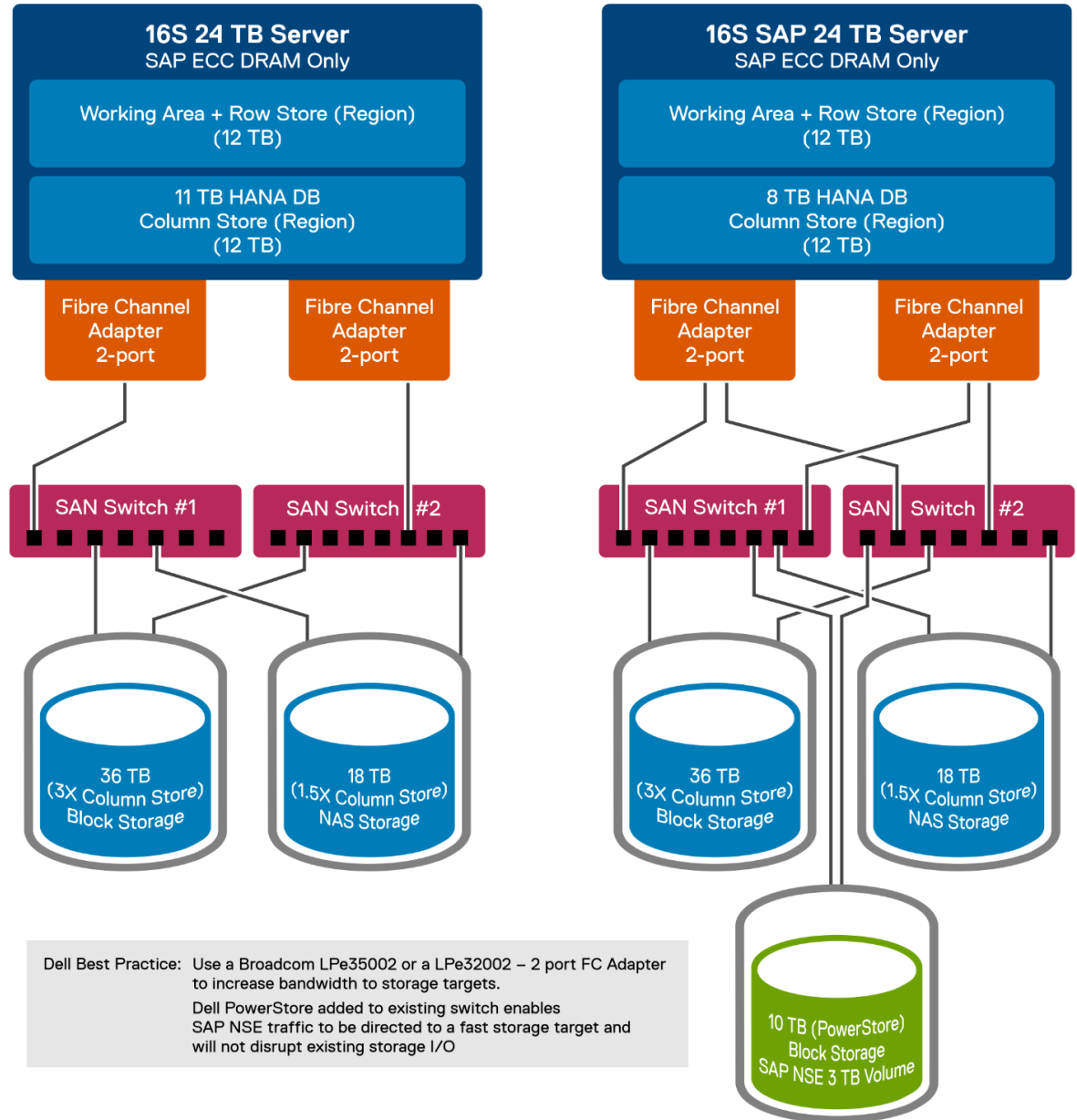
## Use cases

Customers can use the SAP HANA NSE solution to:

- Maintain a target memory size with existing SAP HANA servers
- Implement NSE on existing infrastructure before migrating data
- Reduce costs in production and nonproduction systems
- Reduce their SAP HANA footprint with extremely large SAP HANA databases where no alternative method of meeting the memory requirement is available

## Solution architecture

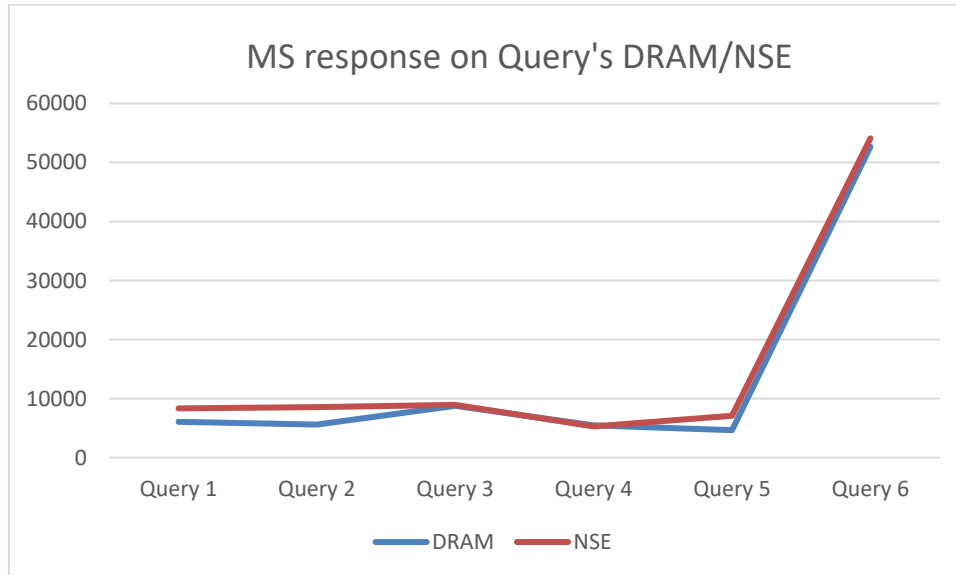
The following diagram shows the architecture of the NSE with PowerStore solution:



## Performance

### Test summary

To validate the solution, 2 TB of compressed SAP S/4 data was loaded into SAP HANA and partitioned into hot data (DRAM) and warm data (NSE). The warm storage is on SAP-certified PowerStore storage with Intel Optane NVMe drives. Write queries were created to target hot and warm data, and the NSE was sized to measure I/O performance. As shown in the following figure, a full table scan was run in Query 6. The NSE response was in line with DRAM. Performance scales predictably with an increase in NSE buffer size.



## Conclusion

SAP HANA licensing fees increase as your in-memory data grows. An additional cost of acquiring bigger SAP HANA servers arises as the in-memory data requirements grow. To mitigate the steeply rising cost of exponential SAP HANA data growth, customers can achieve drastic cost savings with the power of Dell PowerStore with Intel Optane NVMe and SAP HANA NSE.

## References

For more information, see the following documentation:

- [SAP HANA Data Tiering with SAP Native Storage Extension](#)
- [Dell PowerStore: Introduction to the Platform](#)

You can find a comprehensive list of documentation for this solution at the [Dell Technologies Solutions for SAP HANA](#).

Dell Technologies welcomes your feedback on the solution and the solution documentation. Contact the Dell Technologies Solutions team by [email](#).

### Contact us

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