SAP HANA and Lenovo ThinkSystem SR950 – A Perfect Match
Article

SAP HANA is an in-memory data platform that is deployable as an on-premise appliance, with certified server and storage hardware through a Tailored Datacenter Integration (TDI), or in the cloud. It is a revolutionary platform, which is best suited for performing real-time analytics, and developing and deploying real-time applications. SAP HANA is a combination of the SAP HANA Database, Data Modeling, SAP HANA Administration and Data Provisioning in one single suite.

SAP HANA is the first major database platform optimized for Intel Optane DC Persistent Memory. SAP HANA automatically detects persistent memory hardware and adjusts itself by placing data structures that would benefit the most in persistent memory, while all others remain in DRAM. The result is an eye-popping 12.5x faster system restart time for a 6 TB system. This means less downtime when implementing maintenance or security updates. Intel Optane memory also provides an average of 2X more data in memory and 56% lower memory cost in SAP HANA scale-up environments than the previous generation.

The Lenovo Solution for SAP HANA provides outstanding capability for SAP HANA to drive enterprise-critical insights in real time. Powered by ThinkSystem SR950 mission critical servers and the latest Intel Xeon processors, the solution is designed to improve your SAP HANA data foundation and help lower total cost of ownership. When paired with Intel Optane DC Persistent Memory, the solution can also increase SAP HANA capacity and reduce business downtimes.

Figure 1. Lenovo ThinkSystem SR950

SAP and Lenovo Partnership

For years, Lenovo systems have provided differentiating advantages for diverse SAP application workloads powering the digital economy. Whether your business requires a high-performance data center or a small office, the Lenovo portfolio of x86 servers, storage, and software can help your organization to align and integrate processes, communicate with employees, partners, suppliers, and customers in new ways, improve efficiency, and fully use your IT investment to increase the value of your business.

SAP and Lenovo have enabled several innovative solution offerings including SAP HANA and the companies continue to drive joint innovation to deliver new strategic solutions. Lenovo is a SAP HANA market leader and has shipped over 12,000 systems to customers worldwide.

The Lenovo solutions for SAP HANA are architected and designed for:

- Better business outcomes with industry leading SAP applications
- Simplified acquisition and deployment with best practice, optimized and proven with end-to-end documentation
- Enhanced service and support throughout the solution lifecycle

In addition to the joint solution development and enablement of SAP HANA, SAP is also a Lenovo customer and runs their HANA platform on Lenovo Systems (read the case study). SAP also uses Lenovo systems for development of current and next generation SAP HANA applications, and used the SR950 for the performance benchmarks with Intel Optane DCPMM.

SAP HANA Use Cases

Here are typical use cases for SAP HANA.

SAP S/4HANA

The core use case is the combination of Analytics and Transactions in the environment of one SAP S/4HANA system. This results in data that is operational and available in real-time.

Transactional Applications include:

- Product planning
- Inventory management
- Shipping and payment
- Sales force automation
- Supply chain management
- Customer relationship management

The transitions to SAP S/4HANA typically fall into one of 3 transition scenarios:

- New Implementation – new or existing SAP customer implementing a new SAP HANA S/4HANA with initial data load.
- System Conversion – complete conversion of an existing SAP Business Suite to SAP S/4HANA.
- Landscape Transformation – consolidation of current regional SAP Business Suite applications or selective data transformation into one global SAP S/4HANA system.

SAP BW/4HANA

The core use case is managing consolidated data across the entire enterprise using a standardized data model to support real time decision making.

SAP Business Warehouse and analytics applications typically include:

- Business planning & analytical services
- Enterprise reporting, query, and analysis
- Enterprise data warehousing
- Data from SAP & non-SAP applications

Lenovo Solution for SAP HANA Overview

With the Lenovo Solution for SAP HANA, your organization will be able to instantly access, model, and analyze all of your SAP business transactional and analytical data from virtually any data source in real time fully enabling the digital enterprise.

The Lenovo Solution for SAP HANA consists of the components shown in the following figure.
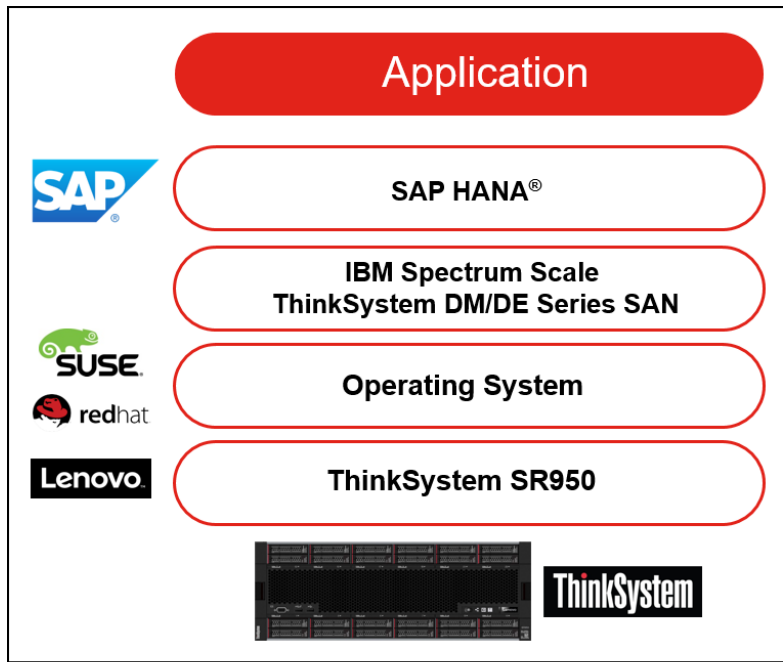

Figure 2. Components of the Lenovo & SAP HANA solution

The Lenovo Solution for SAP HANA helps you make faster more informed decisions, even with escalating data loads. The reason is that the solution is designed to maximize your system performance to provide a smarter, more efficient approach to resource management and scalability. This results in excellent SAP HANA application value and on-going investment protection.

Running on fast and powerful new ThinkSystem SR950 mission critical servers, SAP HANA software can play a critical role in providing the business insights you need from your SAP Business Warehouse (BW), SAP ERP, SAP S/4HANA and other SAP application data. The new mission critical servers are designed to provide faster performance and support for more memory. Using next generation Intel Xeon processors, the Lenovo Solution for SAP HANA is purpose-built to support large-scale SAP HANA deployments

Large memory configurations are available for SAP S/4HANA applications. You can scale up memory and also easily create multi-node, scale-out configurations by networking multiple nodes together enabling support for larger SAP HANA memory sizes. This modular approach enables you to grow your infrastructure as your SAP HANA environment grows. In addition, the Lenovo solution integrates high availability with automatic failover features eliminating the need for SAN storage often required in other vendor solutions.

Lenovo also provides the flexibility to choose from a preconfigured solution or a custom Tailored Datacenter Integration (TDI) solution. Preconfigured models optimized for SAP HANA and validated by SAP can help speed time to value for your SAP BW/4HANA and SAP S/4HANA implementations.

Advantages of the Lenovo Solution

Lenovo has several advantages with its SAP HANA solution using the powerful ThinkSystem SR950.

Server Advantages

The ThinkSystem SR950 mission critical servers are ideal for your most demanding SAP HANA deployments, providing superior capability and greater business value. The SR950 is a 4U rack server capable of supporting up to 8 processors. It features a modular system with all components accessible via the front or rear of the server helping to simplify server management and service. The SR950 supports up to 12 NVMe drive bays for increase storage at lower latency and up to 24 hard disk or solid state disk drive bays for increased storage capacity. Support for 128GB 3DS RDIMMs enables up to 6TB of memory in a four socket configuration and 12TB of memory in an eight socket configuration.

The Lenovo Solution for SAP HANA incorporates a pay-as-you-grow design for larger workloads in the future. This combination allows you to reduce your TCO by:

- Achieving higher utilization and lower acquisition costs with improved capacity and performance.
- Speeding server deployment and serviceability.
- Reducing downtime by swapping components quickly, including compute, storage and I/O as well as fans and power supplies.

Storage Advantage

Lenovo also offers several storage options for SAP HANA, including:

- IBM Spectrum Scale
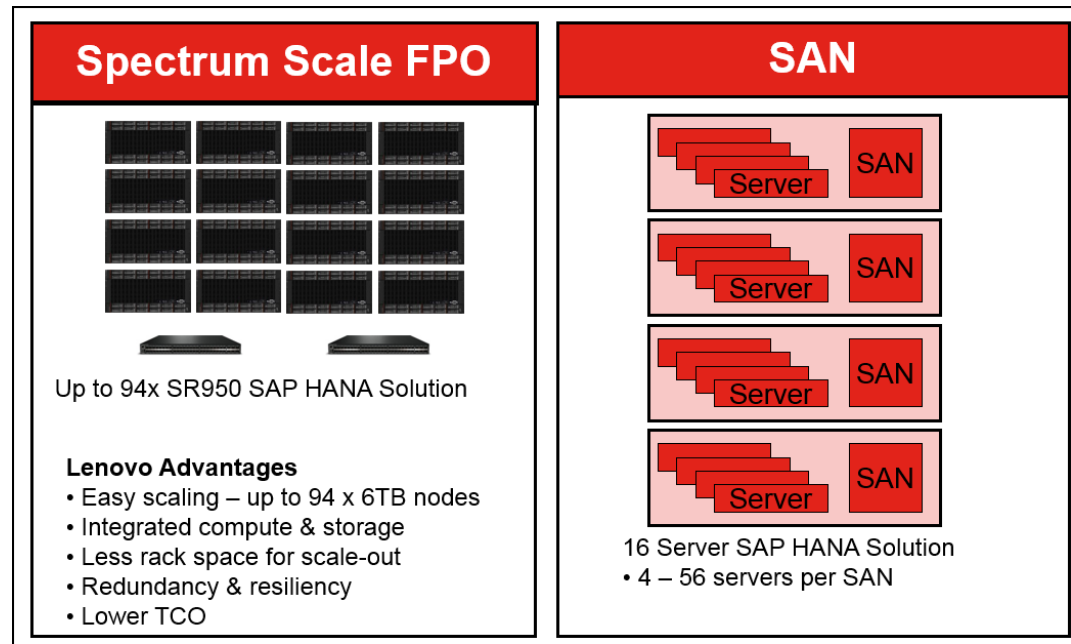- SAN Storage based on ThinkSystem DM or DE Series arrays

Figure 3. Storage Solutions for SAP HANA

When IBM Spectrum Scale is coupled with the workload-optimized ThinkSystem SR950 server, you can combine multiple server models to create multi-node, scale-out configurations. Multi-node, scale-out configurations enable you to achieve larger SAP HANA memory sizes by simply adding server compute nodes. These multi-node, scale-out configurations support up to 94 nodes for SAP Business Warehouse and data mart workloads as well as up to four nodes for SAP S/4HANA workloads. The validated multi-node scale-out configurations do not require a storage area network (SAN), because Spectrum Scale has the unique capability to use the storage contained within each server node.

If you prefer SAN Storage for your SAP HANA implementation, Lenovo also offers the DM and DE Series storage arrays. The ThinkSystem DM Series improves customers TCO and time to value with their advanced data management features offered through ONTAP. The Unified Architecture of block and file workloads allows customers to reduce their hardware requirements and utilize one management system for both NAS and SAN deployments. DM Series also support backup and recovery based on storage Snapshot copies.

ThinkSystem DE Series storage arrays maximize efficiency by combining high performance with industry-leading, enterprise-proven availability features. DE Series deliver up to 1.0M sustained IOPS and response times measured in mere microseconds. They also generate up to 21GBps of read throughput, enough for even your most bandwidth-intensive workloads. Surprisingly, thisincredible performance comes at an affordable price, making the DE Series the ideal solution for cost-conscious businesses.

High Availability

The Lenovo Solution for SAP HANA offers superior reliability, availability and serviceability features. Consistently ranked #1 in reliability by ITIC , Lenovo servers offer capabilities to protect the system against consumed errors that could reach critical applications. Self-monitoring, error detection, and self-healing along with predictive failure analysis. Lightpath diagnostics, corrupt data containment and Fault Resilient Boot help predict and quickly identify issues, which helps decrease system downtime. The result of built-in system protections is outstanding system resilience.

Choice of Operating Systems

The Lenovo Solution for SAP HANA, also offers a choice of operating system support allowing you to choose the operating system that best fits your datacenter requirements. You can choose SUSE Linux Enterprise Server for SAP Applications or Red Hat Enterprise Linux for SAP HANA, and the appropriate subscription and support. In addition, you can choose the Spectrum Scale or SUSE Enterprise Storage software license that matches your configuration requirements along with the appropriate software maintenance and support needed to enhance the availability and resiliency required for large production environments.

Service and Support

To speed deployment and simplify management of your SAP HANA system, Lenovo offers comprehensive solution services and support, which include:

- Pre-planning, on-site installation and configuration
- On-going maintenance and system updates
- Hands-on skills transfer and detailed post-installation training and documentation

In addition, Lenovo can provide remote Managed Services which includes:

- Integrated solution support
- On-going maintenance and updates to hardware, operating system software and Spectrum Scale or DSS-C
- Continuous monitoring of key SAP HANA solution components
- Simplified support processes, with expert consultants assisting with troubleshooting and problem-determination
- Assistance to help improve availability and reduce problem resolution time

- Proactive IT planning and preventative support advice and services

SR950 SAP HANA World Record Performance

The Lenovo ThinkSystem SR950 holds 9 performance world records with the 4 socket SAP HANA BWoH benchmark (as of August 12, 2019). This includes data load, query throughput and query runtime. Three of the records are new on the BWoH version 3 benchmark (10.4B records) and six are maintained on the BWoH version 1 benchmark (1.3B and 2.6B records).

Read the SAP HANA BWoH performance reports:

- SAP HANA BWoH 4S 10.4B v3 - new
- SAP HANA BWoH 4S 1.3B v1 - maintained
- SAP HANA BWoH 4S 2.6B v1 - maintained

The SAP BW Edition for SAP HANA (BW/4HANA) Standard Application Benchmark is the latest addition to the list of SAP BW benchmarks and goes well beyond the scope and features used in the BW-AML benchmark. The new benchmark is designed to fully utilize the new capabilities of SAP HANA to process the benchmark workload. The benchmark consists of three phases data load, query throughput and query runtime.

The benchmark scenario represents typical mid-size customer scenario and volumes for SAP BW running on SAP HANA. The benchmark simulates a variety of users with different analytical requirements and measures the key performance indicator (KPI) relevant to each of the three benchmark phases.

The three benchmark phases are as follows:

1. Data load phase, testing data latency and load performance
2. Query throughput phase, testing query throughput with moderate complex queries
3. Query runtime phase, testing the performance of running very complex queries

The Lenovo ThinkSystem SR950 server also delivers world record SAP application performance as demonstrated by the recent 4 socket SAP SD 2 tier benchmark result.

Read the SAP Sales and Distribution performance report:

- SAP Sales and Distribution 4S Report - new

Conclusion

The Lenovo and SAP partnership and solutions delivers competitive advantages for SAP HANA platforms. Lenovo provides numerous advantages including the server, storage, service, operating system, high reliability, scalability and World Record SAP HANA and application performance. These advantages make the Lenovo SR950 the ideal server to run SAP HANA.

Further reading

For further reading, see these resources

- Lenovo Press product guide on the SR950
- SR950 product web page

This article is one in a series on the ThinkSystem SR950 and SR850 servers:

- Five Highlights of the ThinkSystem SR950
- Five Highlights of the ThinkSystem SR850
- Choosing between Lenovo ThinkSystem SR850 and SR950
- Workloads for 4-Socket and 8-Socket Servers
- Usability in the Design of the ThinkSystem SR950
- The Value of Refreshing Your 4-Socket Servers with the ThinkSystem SR950
- ThinkSystem SR950 Memory Decisions
- ThinkSystem SR950 Server Configurations
- The Value of Refreshing Your 8-Socket Servers with the ThinkSystem SR950
- RAS Features of the Lenovo ThinkSystem SR950 and SR850
- Lenovo ThinkSystem SR950 New Options and Features - December 2017
- ThinkSystem SR950 Performance Leadership
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- Accelerate Your 4- and 8-Socket Server Refresh Cycle
- SAP Business Process Applications and Lenovo ThinkSystem SR950 – A Perfect Match
- ThinkSystem SR950 New Options - March 2018
- **SAP HANA and Lenovo ThinkSystem SR950 – A Perfect Match**
- ThinkSystem SR950 Performance Leadership Continues
- New Solution for SAP HANA - Lenovo ThinkAgile HX
- The Advantages of Keeping Mission Critical Workloads On-Premises vs Going to the Cloud
- SQL Server Migration and Lenovo ThinkSystem SR950

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Related product families

Product families related to this document are the following:

- Mission-Critical Rack Servers
- ThinkSystem SR950 Server
- 4-Socket Rack Servers
- 8-Socket Rack Servers

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