A Buyer's Guide to SAP HANA Infrastructure

An Essential Guide to Navigate the SAP HANA Journey

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SAP HANA at a Glance

SAP HANA is a distributed in-memory data platform that supports real-time analytics and extreme transaction volumes while providing organizations with speed, agility, and new insights.

In-memory database

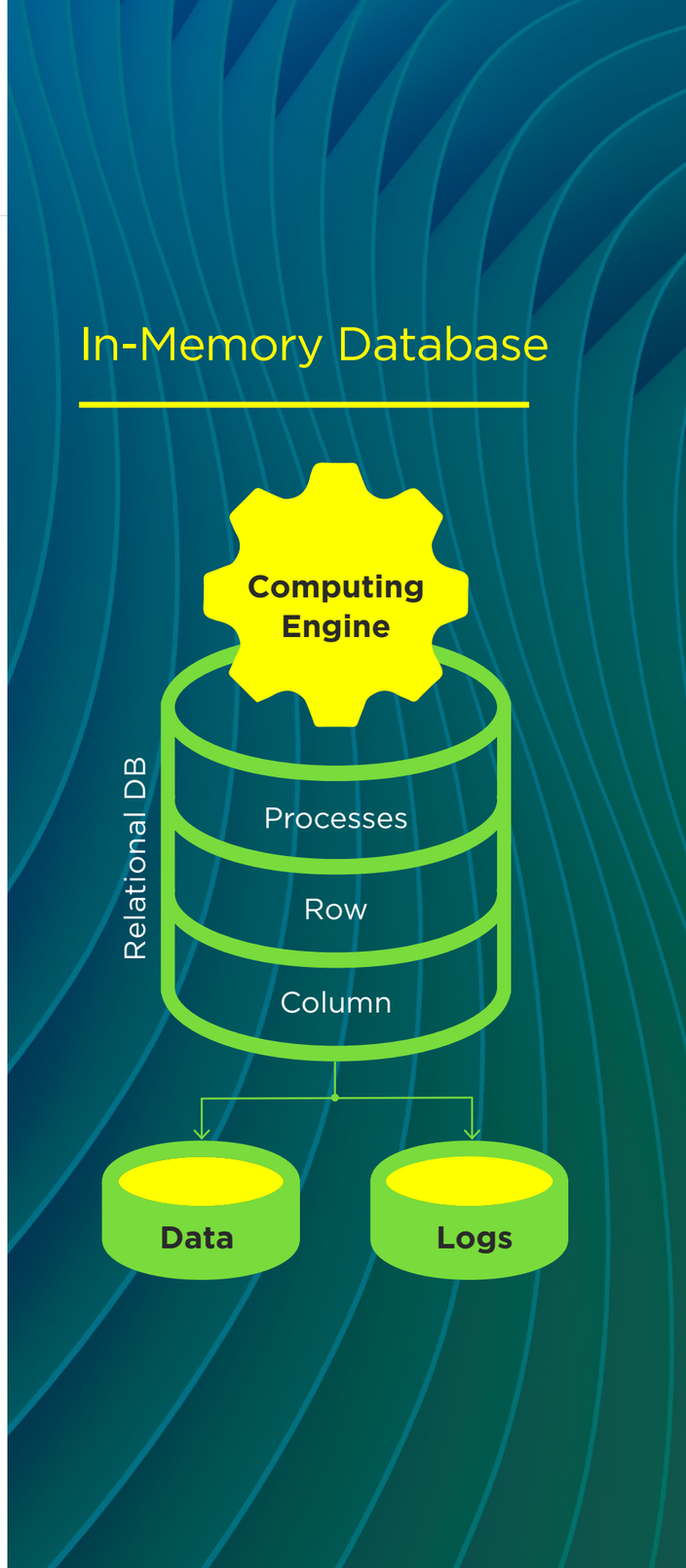
SAP HANA is an in-memory data platform that allows processing of massive quantities of data in the main memory to provide extremely fast results from analysis and transactions. This next generation business platform brings the transaction and analytics layers together, thus significantly increasing the performance of applications, while at the same time handling structured and unstructured data to enable reporting without latency. Its open architecture permits simplification of IT delivery processes, solves performance issues, and improves business processes.

Process large data volumes

SAP HANA can crunch massive amounts of data at incredible speeds by simplifying and optimizing the data layer thus allowing enterprises to collect, process, and analyze massive volumes of streaming data from any source. As a result, it allows firms to enhance performance and reduce hardware & maintenance costs from running multiple data warehouses and operational & analytical systems.

47%

of the costs associated with hardware, software, and labour can be saved with SAP HANA



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SAP HANA AT A GLANCE

Enables real-time analytics

Since HANA brings both OLTP and OLAP together, it can truly empower organizations in their real-time analytics implementations and help them gain insights from both internal and external data sources. Its ability to support a variety of data types means organizations can analyse high speed event streams, combine static and streaming data to build complex analytical models.

Speeds up processes and improves decision making

SAP HANA delivers levels of performance that exceed, by thousands of times, those of conventional platforms. It transforms the business by streamlining transactions, analytics, planning, predictive, and sentiment data processing onto a single in-memory database helping organizations get immediate answers to really complex questions in seconds.

A 2 server ITOA license is provided free with a Lenovo HANA appliance

A requirement for Big Data analytics

SAP HANA's wealth of interfaces for application development, including modelling for R, and its integration with Spark or Hadoop landscape, helps to ensure that it is a central component for accessing data. As a result, HANA adds its high-speed processing capabilities to massive amounts of streaming data, which makes it the component of choice for Big Data environments.

Provides real-time insights on IT operations

Most companies use diverse monitoring tools to support their daily IT operations. The result is a fragmented view of partial operations. SAP HANA with IT Operations Analytics (ITOA) brings analytics and a predictive, holistic, single pane-of-glass view to IT operations. ITOA can combine a variety of master data with IT events and brings predictive capabilities and insights, while reducing the number of monitoring tools, increasing visibility, reducing complexity, and saving licensing costs.

4-Year Cost Comparison

$13,505,940

Traditional ERP

$7,123,373

ERP on HANA

Source: Forrester Research, (Projected Cost Analysis of SAP HANA & Cost Savings Enabled by Transitioning to HANA)

SAP HANA collapses the technology stack and eliminates redundant hardware and software to save money and reduce complexity through automation and integrated systems.

The Infrastructure Requirements of HANA

Need for a robust infrastructure

The performance characteristics of SAP HANA are closer to the supercomputing world than to conventional IT environment. It's also essential to remember that transferring enterpise data from disks to server RAM requires a fundamental rethink of infrastructure, especially the server. It requires a robust infrastructure that can run massive transactional & analytical workloads from the same underlying system. It needs high speed, multi-core, high memory servers with highest RAS capabilities. Hence, the processor power & memory capacity become critical.

Requires performance, reliability & availability

If the reliability and performance of the hardware infrastructure is not up to the desired level, it will put the whole HANA implementation into jeopardy. Similarly, the impact of outages affecting core ERP systems are quite well known. And real-time analytics systems are also proving to be equally sensitive to downtime. Hence, it is critical that the infrastructure is both highly reliable and available as even brief interruptions of service may impair decision making.

Should be scalable for future data growth

Scalability is another essential prerequisite for protecting investment, while optimising TCO. If the infrastructure has no built-in scalability, it can lead either to fragmented developments and increasingly complex IT set-ups or to wasted investment.
Failing to take these measures upfront can lead to disastrous structural and financial impact. Hence, a successful HANA implementation depends on having the right SAP certified infrastructure that is scalable as per the needs of the organization.

Challenges of IT Decision Makers

It is of critical importance for buyers to make the right infrastructure choice while keeping an eye on costs at the same time.

Infrastructure sizing

In a SAP HANA implementation, it is critical that the infrastructure sizing is done correctly as the license fee on HANA is based on per GB of memory used in the hardware appliance. If the appliance is too big, buyers will end up paying extra for hardware and software, thus pushing up costs. And an appliance that's too small may not meet the requirements, thus hampering the performance.

Architecture & design

While deciding on the infrastructure, buyers need to take into account the hardware architecture and design that will give maximum performance and scalablility, while at the same time providing high reliability and availability. In a HANA environment, which combines both OLTP and OLAP systems, the need for high-availability architectures is even greater.

Keeping an eye on costs

While the hardware infrastructure and software licensing costs account for a majority of the total costs, one can't ignore the costs used to host the infrastructure. These include the data-center costs for hosting the servers, the energy consumption of the IT equipment, and cooling costs, which account for anywhere between 15 and 20 percent of the total cost over a three-year period.

Migration

Choosing the right migration strategy is a critical challenge as most existing SAP applications will require a database migration to HANA. Hence, buyers need to partner with someone trusted and who has the experience of having implemented such migration projects.

Over-provisioning the hardware means vvlicense

Accurately sizing the infrastructure for HANA implementation is critical as it has a direct impact on both cost and performance.

15-20%

of total costs are incurred in datacentre hosting and power & cooling.

The Lenovo Advantage

Lenovo is a market leader in hardware systems for SAP HANA, offering the highest performance and reliability.

Based on the SAP certified Lenovo ThinkSystem

Hardware systems for HANA are certified by SAP and Lenovo holds the largest portfolio of SAP certified solutions for HANA based on X6 generation. Besides, the Lenovo ThinkSystem platform is a reference architecture for SAP itself. While similar hardware components are used by most vendors in their respective systems for HANA, there are fundamental differences between Lenovo's architecture and other vendor offerings. Lenovo's servers are the only SAP-certified hardware available that have been built around the IBM Spectrum Scale file system, which give it a unique edge in both cost and performance. Besides, it's the only vendor to use open source Linux features like Bcache and supports HCI-like architecture for both single node and scale-out systems, which add to the perfiormance. The company has gained distinctive, leading-edge cluster technology, along with one of the industry's most experienced SAP HANA development and support organizations.

SAP relies on Lenovo servers to power its internal HANA deployment. Besides, Lenovo infrastructure powers SAP's HANA on Cloud service

Three-Year Scale-Up Cost (Single-Node)

$348,318
LENOVO

$507,880
CISCO

$506,550
HPE

Source: Quark + Lepton Whitepaper

Lenovo has shipped more than **7,700 SAP HANA** systems worldwide.

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THE LENOVO ADVANTAGE

Lenovo's ThinkSystem servers have been Ranked No.1 in Reliability for x86-based systems by the ITIC Global Server Hardware Reliability Report 2016-2017

Performance, scalability & reliability

Lenovo's latest X6 server models, which use the 22 & 24-core Intel Broadwell-EX v4 processor, give a further boost to its industry-leading performance. SAP-certified benchmark results have shown as much as a 33 percent boost in performance and I/O throughput for this new generation of ThinkSystem servers. Lenovo platform designs also ensure higher availability system monitoring and correction features such as automated processor failover, automated memory page sorting, automated firmware backup, and advanced transaction recovery.

Offers lowest TCO in the market

Three-year cost of ownership of Lenovo systems for SAP HANA are the lowest in the industry for both scale-up and scale-out solutions. Lenovo's scale-up 8-socket, 8 TB solution is estimated to cost 31 percent less than comparable systems from Cisco and HPE. Similarly, for 4-to 16-node clusters of 4-processor servers with up to 2 TB of RAM, the cost of Lenovo's ThinkSystem solutions are 16 percent less than comparable Cisco offerings and 24 percent less than HPE offerings. Almost by any measure, Lenovo offers the lowest TCO in the market compared to any SAP certified HANA hardware vendor.

No external storage necessary

The Lenovo ThinkSystem solution for HANA is certified by SAP for up to 94-node scale-out configurations offering 376 TB of RAM, which is the largest among scale-out vendors. Since Lenovo systems use the IBM Spectrum Scale file system & Linux open source features like Bcache, it does away with the need for expensive & complex external storage. This not only improves performance, but also reduces the cost & complexity involved in setting up and maintaining the infrastructure. Lenovo is the only vendor to offer this type of shared nothing architecture for HANA scale up or scale-out deployments.

Three-Year Scale-Out Cost (4-Socket Cluster)

Source: Quark + Lepton Whitepaper

SAP Certified Hardware Scale-Out Capacity

Source: Quark + Lepton Whitepaper

The largest SAP HANA system in the world with 100TB on memory runs on Lenovo

Seamlessly upgradeable

The legacy System x collaboration between IBM, Intel and Lenovo also brings to bear server firmware & hardware design features that continue to support unique flexibility advantages for server component upgrades & replacement, both in terms of physical access that does not require rack disassembly, and extensive socket replacement or bus & power infrastructure considerations. Lenovo's X6 modular design concept has the ability to swap out compute books as memory or processor generations change, thus making the systems seamlessly upgradable.

Available in TDI or appliance

The widely used and SAP supported deployment types for HANA are appliances and TDI (Tailored Datacenter Integration). In appliances, hardware and software are pre-validated, pre-certified, & pre-integrated, in a fully managed and dedicated environment with predictable performance and an integrated support model. TDI, on the other hand, enables existing datacenter components such as storage and networks to be reused. However, as TDI is a customizable solution, it brings in its own set of complexities like solution design,

Hyperconverged infrastructure

The Lenovo ThinkAgile HX Series Appliances are designed to simplify IT infrastructure, reduce costs, and accelerate time to value. These appliances combine hyperconvergence software from Nutanix with Lenovo enterprise platforms and deliver the most feature-rich hyperconverged infrastructure by bringing the benefits of web-scale technologies to enterprise applications through data protection, infrastructure resilience, management & analytics, and security. The combination of HANA on Lenovo X6 appliances and SAP application stack on HX is a 100 percent HCI environment, which is exactly the way the industry is moving towards.

Scale easy with Lenovo

Step 1

128 GB, S4 HANA & BW4H

Step 2

S4 HANA - 8 TB*

BW4H - 4 TB*

Step 3

* With Current Generation, Next Gen could be higher

Lenovo: Helping Solve
Some of Humanity's Greatest Challenges

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