

SUSE and Lenovo: A Powerful Foundation for SAP Applications

Most enterprises today are undergoing a digital transformation to stay competitive—and have adopted SAP solutions to help them evolve. Together, SUSE and Lenovo provide a robust foundation optimized for SAP applications so businesses can get more out of their investment and drive present and future growth.

Table of Contents	page
Optimized to Run SAP Solutions	2
Target Audience	2
Extending the Value of Your SAP Applications	2
A Partnership Suited to Supporting SAP Solutions	2
A Closer Look at the Components	3
SUSE and Lenovo: The Right Choice for Your SAP Deployment	6



Optimized to Run SAP Solutions

SAP solutions, including SAP HANA, can help enterprises embrace today's digital landscape. They can solve complex problems; help business leaders make faster, smarter decisions; and aid in keeping companies agile.

With so much at stake, it's critical to make the right choices when it comes to choosing a foundational platform for your SAP solutions to run on. Find out how SUSE and Lenovo have partnered to form a powerful infrastructure that can help you get the most out of your SAP applications. Their combined solution simplifies platform migration, management and consolidation so your business can thrive.

Target Audience

This white paper is meant for CIOs, solution architects and technical architects who already deploy or are planning to deploy SAP solutions. This paper contains links in various sections to more technical guides for those in search of more detailed information.

Extending the Value of Your SAP Applications

As IT environments grow more complex and expensive to manage and maintain, SAP has begun to simplify its own product portfolio and standardize solutions on SAP HANA, a more prescriptive, Linux-based framework on which partner companies can develop their own applications. With SAP's announcement that it will require HANA to run all SAP applications by 2025, businesses are increasingly turning to Linux and open source to prepare.

Enterprises that choose SAP HANA appreciate how its in-memory capabilities greatly improve business performance and promote agility, but recognize that they can only realize that improved performance and agility if HANA—and other SAP

solutions—run on an operating system and servers that are fully reliable, available, scalable, manageable and secure. When considering infrastructure options, cost and flexibility are important, too, of course.

Together, SUSE and Lenovo provide the most flexible, cost-effective way to build a data center. Lenovo servers combined with open source infrastructure solutions from SUSE deliver the dependable, secure, high-performance solutions that enterprises need.

A Partnership Suited to Supporting SAP Solutions

Together, SUSE and Lenovo offer a combination of features that deliver the reliability, availability and serviceability that SAP HANA and other SAP solutions require today. SUSE and Lenovo both have a long history with SAP in developing and testing scenarios, and optimizing their products to enhance the performance of SAP applications.

“Collaborating with SAP and Lenovo truly transformed us into a forward-looking company, ready to pursue explosive business growth.”

RODRIGO AMPUERO PEIRANO

CIO
Hortifrut

SUSE offers the world's only SAP-optimized Linux solution that runs on fully certified, high-performance x86 Lenovo servers. SUSE Linux Enterprise Server for SAP Applications provides the comprehensive software platform for SAP HANA. From the operating system and high-availability features to the installation wizard and firewall rules, you essentially get a HANA server and an SAP application server in one product.

High availability is another benefit of the combined SUSE-Lenovo solution. With Lenovo's world-class predictive failure analysis capabilities and SUSE Linux Enterprise Server's ability to tap into Intel's Machine Check Architecture enhancements, you can identify errors and resolve them before they cause downtime. SUSE Linux Enterprise Server for SAP Applications also includes built-in high-availability clustering and automated failover, as well as an optional SUSE Linux Enterprise Live Patching feature.

The value of the combined SUSE-Lenovo solution is clear: SAP itself uses SUSE Linux Enterprise Server and Lenovo systems for its own production and development environment. Lenovo is number one in server reliability and customer satisfaction, and is a partner-focused company with a history of working with SAP solutions. Meanwhile, SUSE provides the leading platform for SAP solutions on Linux and is the recommended and supported OS of choice for SAP HANA and S/4HANA.

A Closer Look at the Components

Lenovo platforms and SUSE open source technology can help minimize downtime and increase operational efficiency. Here's a closer look at each piece of the combined solution.

SUSE Linux Enterprise Server for SAP Applications

The leading Linux platform for SAP HANA, SAP NetWeaver and S/4HANA provides optimized performance and reduced downtime as well as faster migration and SAP landscape deployments. It is the premier operating environment for SAP solutions.

INCREASE SERVICE AVAILABILITY

It increases service availability of mission-critical operations with built-in business continuity features that include automated data recovery; resource agents that automate the takeover in SAP HANA system replication setups; and full operating system roll-back. You can find a setup guide for system replication [here](#).

The solution includes a built-in firewall and encryption management to protect data in remote data centers. SUSE also offers a

unique guide to help you secure SUSE Linux Enterprise Server for SAP Applications for running HANA: [Operating System Security Hardening Guide for SAP HANA](#).

A high-availability SAP-certified extension provides an integrated clustering solution for physical and virtual Linux deployments, which allows you to implement highly available Linux clusters to eliminate single points of failure. You can find SUSE high-availability configuration guidelines for SAP HANA on Lenovo [here](#).

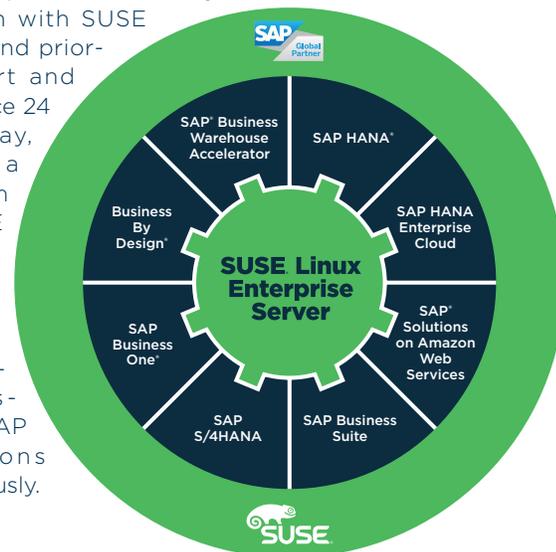
IMPROVE OVERALL PERFORMANCE

The SUSE Linux operating system is optimized for performance. The page cache limit enhances performance by allowing the administrator to limit the amount of page cache used and free up memory for more important tasks. Upon installing SUSE Linux Enterprise Server, you have the option to tune SAP HANA performance to preset benchmarks. A dedicated update channel delivers operating system enhancements that correspond to SAP application updates.

DECREASE DEPLOYMENT TIME

SUSE Linux Enterprise Server combines application installation, migration and superior support capabilities into a unified solution. Time-saving features include an installation wizard with tuning parameters; an installation configuration package that allows you to quickly and accurately configure SAP applications for optimal performance; easy integration with SUSE

Manager; and priority support and maintenance 24 hours a day, seven days a week from both SUSE and SAP that helps you resolve issues with the operating system and SAP applications simultaneously.



SUSE Linux Enterprise Live Patching

SUSE Linux Enterprise Live Patching is a smart, open source solution that delivers live kernel patching for stability and security updates without the need to reboot. The subscription-based extension of SUSE Linux Enterprise Server for SAP Applications provides access to fixes for any SUSE Linux Enterprise Server 12 maintenance Linux kernel released in the last 12 months.

SUSE Linux Enterprise Live Patching is built on an open source technology called kGraft, which allows for runtime patching of the Linux kernel without having to stop the kernel. It keeps mission-critical systems running and allows you to avoid downtime with workloads such as in-memory databases, time-consuming simulations and compliance tasks.

With Live Patching, you can increase service availability, reduce planned downtime and maintain the security of your systems.

SUSE Manager

SUSE Manager is a best-in-class open source IT infrastructure management solution for your software-defined infrastructure. It allows DevOps and IT operations teams to reduce complexity and regain control of IT assets by enabling comprehensive management of multiple Linux distributions, systems, virtual machines (VMs) and containers—all within a single, centralized solution. It simplifies the maintenance of your Linux deployments across physical, virtual and cloud environments.

The solution provides a graphical visualization of IT systems' status and their relationships and allows you to organize your Linux servers into logical groupings for easier management. You can also identify which Linux assets need attention at any time. From automated Linux server provisioning and patching to configuration of tens of thousands of servers, SUSE Manager helps you reduce costs, streamline operations and improve compliance and service quality.

As a result, your organization can decrease total cost of ownership while securing enterprise systems and improving compliance and service quality. You can find a setup guide for managing SAP HANA in a scale-out environment using SUSE Manager [here](#).

Lenovo Storage Solution for SAP HANA, Powered by SUSE Enterprise Storage™

SAP HANA offers many benefits, but its persistent storage requirements demand a scalable, reliable and fail-safe architecture. These requirements can drive an enterprise to build an expensive proprietary storage array that uses costly flash technology to help eliminate hard disk bottlenecks. In addition to persistent storage, the growth of data logs and system backups can triple the storage requirements of your SAP HANA database, increasing the total cost of acquisition.

The Lenovo Storage Solution for SAP HANA, based on SUSE Enterprise Storage, can help. Designed especially for SAP HANA scale-out scenarios, the solution can simplify and scale the storage of large data on Lenovo enterprise systems. Using industry-standard servers and software infrastructure, hyperscale software-defined data centers can reduce costs by 40 percent versus proprietary hardware.

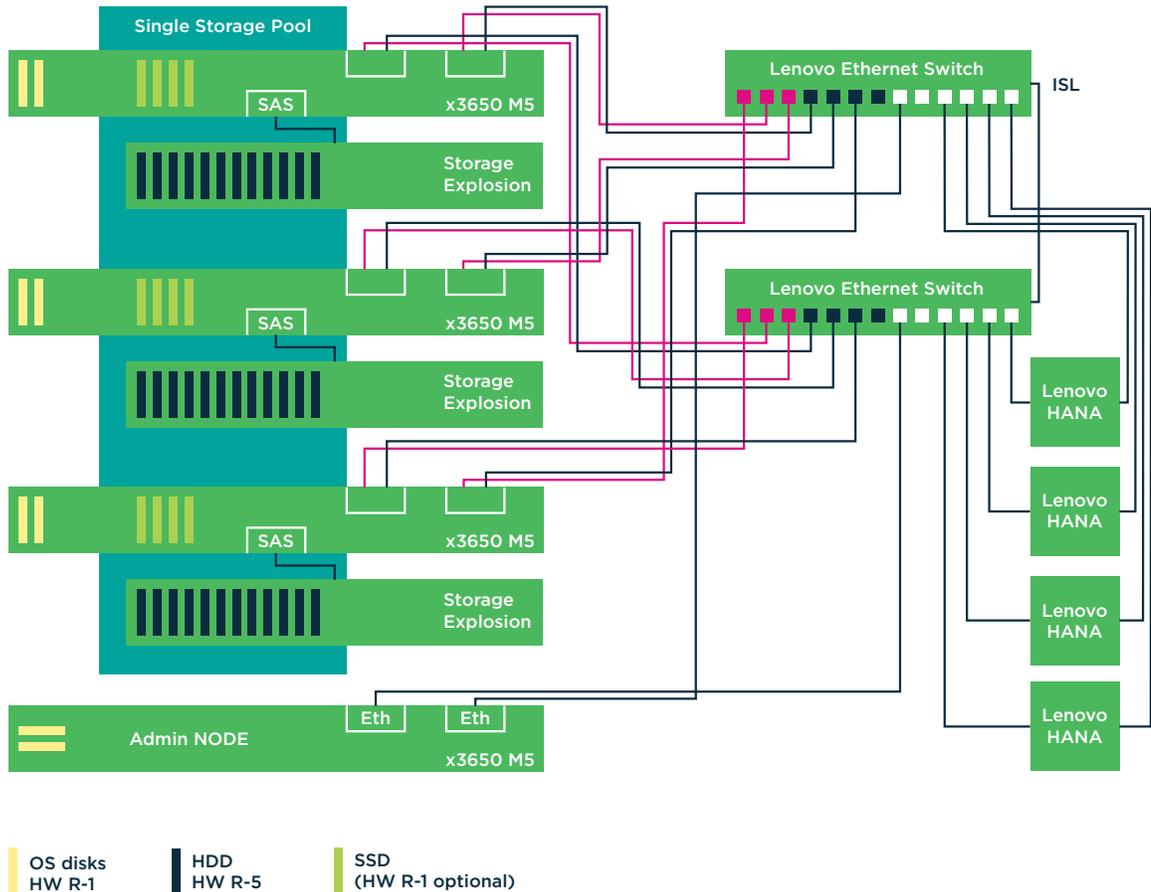
Built on the open source Ceph project, the distributed software-defined storage cluster is suitable for SAP HANA data, logs and backups. It offers:

- *Block, file and object data access capabilities in a single cluster, simplifying administration and reducing operational costs*
- *Multisite object replication and asynchronous block mirroring, providing uninterrupted serviceability*
- *A new open source management framework for simplified management and improved cost efficiency*

Lenovo offers three configuration options: HDD, an all-hard-disk-drive configuration for cost-conscious infrastructure (includes Flashcache); Flash, performance optimized and built on enterprise capacity and solid-state drives (SSDs); and Capacity, which maximizes node capacity with Lenovo storage expansion units.

With the Lenovo storage solution, you get high availability through redundant storage nodes. You can mix storage types (such as SSD and HDD) to meet performance and usage requirements. The solution also lets you stop using tiered storage as a stopgap and embrace a more tested, certified, effective and manageable type of software-defined storage.

Architecture Details



The Lenovo Storage Solution for SAP HANA powered by SUSE Enterprise Storage allows you to introduce a flexible and linearly scalable software-defined storage solution based on the Ceph open source project.

Lenovo ThinkSystem Servers

Lenovo ThinkSystem servers are the most flexible, cost-effective way to run SAP applications. Delivering mainframe-like capabilities in the x86 space, they have a unique modular design that provides a broad set of configuration options in terms of number

of processors (two to eight), memory and I/O slots. That means you get a no-compromise box that you can configure to your specific mission-critical needs without having to build a multi-server ecosystem.

LENOVO THINKSYSTEM SR950 SERVER

The four-unit, eight-processor ThinkSystem SR950 is designed for the most demanding, mission-critical workloads such as in-memory databases, large transactional databases, batch and real-time analytics, and virtualized server workloads. The resilient, scalable system has a large memory and storage capacity, and can scale from two to eight Intel Xeon Scalable processors. The server's modular design provides rapid upgrade and servicing with easy front or rear access to all major subsystems, helping to reduce service costs.

LENOVO THINKSYSTEM SR850 SERVER

The ThinkSystem SR850 is a dense, two-unit, four-processor server designed for exceptional price for performance and flexibility to grow with business needs. Built for standard workloads like general business applications and server consolidation, it can also accommodate high-growth areas such as databases and virtualization. The SR850 gives you the flexibility to configure for performance and reliability along with high memory and storage capacity.

LENOVO SOLUTION FOR SAP HANA TDI

With the Lenovo Tailored Datacenter Integration (TDI) option, you can choose the SAP HANA appliance deployment that works best for your unique data center needs. Options include mission-critical systems, blade systems and rack servers. This combination allows you to take advantage of existing infrastructure, investments and processes, and can help reduce the risks and costs of SAP HANA adoption while improving time to value.

“Even SAP’s own HANA installations are running on SUSE Linux Enterprise Server. Between our own positive experiences with the operating system, SAP’s endorsement and its overwhelming popularity, we had no trouble choosing SUSE Linux Enterprise Server for SAP Applications to support our growing SAP HANA deployment.”

HENG ZHANG

Linux Engineer
Lenovo

SUSE and Lenovo: The Right Choice for Your SAP Deployment

Taking advantage of the benefits of SAP HANA and SAP applications is easier with a solution that addresses all of your technical challenges.

Avoid unplanned downtime for your SAP applications with high availability, automated data recovery and live kernel-patching capabilities for security and stability issues.

Easily and cost-effectively manage and scale storage of your large data sets with software-defined storage.

Protect data with operating system security hardening. SUSE has a history of focusing on IT security; its initiatives include an aggressive international security certification program as well as an integrated antivirus solution for SAP environments.

Simplify system management and maintenance. Use SUSE Manager as a single console to manage multiple Linux distributions and environments. Lenovo XClarity integrates easily into Lenovo servers, switches and storage to automate provisioning and operations management for Lenovo’s SAP HANA appliances and TDI infrastructures.

Speed deployment and migration with a unified solution that includes application installation and support 24 hours a day, seven days a week. Lenovo also offers services that include preplanning; onsite installation and configuration; ongoing maintenance and system updates; and hands-on skills transfer and detailed postinstallation training and documentation.

Together, SUSE and Lenovo deliver a SAP-optimized infrastructure with the reliability, availability and serviceability that you need—all in a flexible, cost-effective package that helps you stay agile and competitive.

Learn More

Learn more about how SUSE and Lenovo can simplify your SAP solution deployment and operations at: www.suse.com/lenovo



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