Drive Your Digital Transformation with SAP HANA on SUSE and HPE

Achieving digital transformation for your organization is crucial. With SAP HANA, you can achieve that transformation, engage your customers and simplify IT—but only if you implement it wisely. SUSE and Hewlett Packard Enterprise (HPE) can help you streamline your move to Linux and to the infrastructure you need to support SAP HANA now and in the future.

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Empower Business Insight and Agility

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

That's one reason it's critical to make the right choices when picking a foundation for your SAP solutions. SAP S/4HANA is the other reason. SAP will be moving all its applications to rely upon SAP HANA in the future, and SAP HANA runs only on Linux. That means the future of the data-driven enterprise will rely on a fast, flexible and stable Linux-based infrastructure.

To build that infrastructure, you need to find technology partners with past success that can offer you high availability for your mission-critical systems and a fast time to value. SUSE and HPE have teamed up to create systems that give you exactly that. With simplified and centralized management and support that's always there for you, our SAP HANA solutions can help your organization capture insight and agility.

Target Audience
This white paper is meant for CIOs, solution architects and technical architects who already deploy or are planning to deploy SAP HANA. For those looking for configuration and setup documents, this paper contains links in various sections to more technical guides.

Better Performance and Faster Time to Value
SUSE• Linux Enterprise Server for SAP Applications and HPE servers together can give you the performance you need to support SAP HANA. In fact, SUSE and the HPE ProLiant DL560 took top spots on all phases of the SAP Business Warehouse (BW) edition for SAP HANA standard application benchmark[1] and the lead spot for three phases of the SAP HANA Standard Application

Benchmark Version 2.[2] You can check out all the recent SAP performance briefs for SUSE and HPE at SUSE.com here.[3]

Just as important, the solution from SUSE and HPE helps to simplify the task of building that infrastructure so you can accelerate your time to value. HPE ConvergedSystem hardware can help you get SAP HANA up and running in hours instead of days.

This speed comes with no sacrifice to stability or security. Built-in business continuity in HPE servers and the SUSE operating system provides protection for critical business operations. You can even reduce planned downtime with SUSE Linux Enterprise Live Patching by applying critical kernel updates without stopping your systems.

HPE offers flexible options, from small business systems on the ConvergedSystem 500 or massive capacity with the ConvergedSystem 900, to custom deployments with the Superdome Flex Server for SAP HANA or through Tailored Datacenter Integration (TDI). Meanwhile, SUSE Manager can help you manage all the Linux across your data center. You can even manage your Linux infrastructure from tools that are likely available in a Microsoft Windows infrastructure.

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1 **http://h20195.www2.hpe.com/v2/GetDocument.aspx?docname=
   a00022518enw**
2 **www.hpe.com/h20195/v2/getpdf.aspx/a00035620enw**
3 **https://suse.lookbookhq.com/suse-and-hpe-on-sap-performance-
   briefs**

This link to Microsoft is key, because SAP HANA is only a part of your business. As organizations move to Linux, most will maintain Microsoft systems for some time, if not indefinitely. SUSE solutions support Remote Desktop Protocol and Active Directory integration, so administrators can use their existing Microsoft credentials to access your SUSE Linux systems. The SUSE and HPE solution is designed to help you migrate at your own pace and ease management in mixed data centers.

Together, SUSE and HPE deliver the best option for organizations looking to quickly take advantage of SAP HANA and prepare their business for the future. That's partially due to their unique partnership.

Longtime Partners in SAP Solutions

SUSE and HPE have worked together for more than 25 years. Some of the results of this are that SUSE Linux Enterprise Server is certified across the entire HPE server and storage line. It is also the only operating system that has been embedded on HPE server motherboards as the base of the Intelligent Provisioning feature since generation 8. HPE has gone even further and named SUSE its preferred partner for Linux, OpenStack and CloudFoundry.

Both SUSE and HPE work closely with SAP to optimize their products to enhance the performance of SAP applications. HPE received an SAP North America Partner Excellence Award 2017 for SAP HANA Technology Innovation,[4] and SUSE was named an SAP HANA Innovation Award Winner 2017.[5] Plus, 28 of the other award winners use SUSE as their operating system of choice.[6] HPE has more than 500 SAP HANA experts available to help you design, modernize and implement your solution.[7]

SUSE Linux Enterprise Server for SAP Applications itself is a product of the partnership between SAP and SUSE. It automates

failover in SAP HANA system replication, and it offers an SAP software Installation Wizard and more that have made it the recommended and supported operating system of choice for SAP HANA and SAP S/4HANA.

Here's a closer look at your deployment options and how SUSE Linux Enterprise Server for SAP Applications complements HPE's offerings.

HPE Superdome Flex for SAP HANA

HPE Superdome Flex Solutions for SAP HANA are built with a modular and standards-based architecture and are certified for HPE scale-up or scale-out SAP HANA configurations. You can start small and grow with the demands of your business, with a modular four-socket architecture that grows seamlessly up to 32 sockets for the largest SAP S/4HANA use cases.

The best-in-class predictive fault handling Error Analysis Engine predicts hardware faults and initiates self-repair without operator assistance, and it contains errors at the firmware level with the HPE "firmware first" approach.

HPE Superdome Flex Solutions for SAP HANA are optimized for in-memory use cases and architected for delivering the highest performance at scale, with up to a maximum of 48 TB of memory in a scale-up configuration. They provide increased uptime and reliability, and are backed by decades of expertise on SAP deployments and cutting-edge innovation.

HPE ConvergedSystem for SAP HANA

ConvergedSystem solutions are prevalidated, factory-tested configurations that you can deploy in weeks instead of months. They include compute, storage and networking resources and the software necessary to run it all. These systems are software defined for easy integration into existing infrastructure.

- **HPE ConvergedSystem 500 for SAP HANA** *supports analytics and data warehousing workloads, as well as*

> "We have been very impressed by the close relationship between SUSE and SAP, and the enterprise-class documentation and support we receive from SUSE."

ARTHUR SHKABATUR
System Administrator
University of Haifa

4 **www.hpe.com/us/en/integrated-systems/converged-system/ sap-hana.html**
5 **www.suse.com/communities/blog/suse-receives-sap-hana-innovation-award-2017-industry-disruptor/**
6 **www.sap.com/documents/2017/10/9ab41894-dc7c-0010-82c7-eda71af511fa.html**
7 **http://h20195.www2.hpe.com/v2/GetDocument.aspx?docname= 4AA0-0503ENW**

smaller business application environments. With node configurations up to 6 TB, these systems offer best-in-class price and performance for SAP HANA.

- **HPE ConvergedSystem 900 for SAP HANA** *delivers massive capacity and amazing flexibility for your data management requirements—offering a 16 TB single in-memory pool, with both scale-out and scale-up options.*

For more details on these HPE ConvergedSystem models, please visit the HPE website.

SUSE Linux Enterprise Server for SAP Applications and Superdome Flex or ConvergedSystem

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

The SUSE Linux operating system includes a feature to limit memory caching that protects system performance. Under normal operation, SAP applications reserve memory cache for themselves. However, the Linux kernel will swap out rarely accessed memory to improve file-system performance. That means that the SAP application data isn't always instantly available—and response time suffers. By allowing the administrator to limit the amount of page caching the kernel performs, you can free up memory for SAP S/4HANA–based applications.

SUSE Linux Enterprise Server for SAP Applications also comes with extended service pack support. This increases the time you have to upgrade to the next operating system service pack from six to 18 months. The idea isn't to put off upgrades, but to allow you to perform upgrades on the best schedule for your organization. For instance, you can align your operating system update with your SAP HANA updates to minimize planned downtime. To keep your systems running, HPE SAP solutions offer 24-hour priority support and maintenance that integrates support teams from HPE, SUSE and SAP to help you simultaneously resolve issues with the hardware, operating system and SAP applications.

HPE Solutions for SAP HANA TDI

While HPE ConvergedSystem for SAP HANA offers complete solutions and fast delivery times, HPE Solutions for SAP HANA TDI offers greater configuration flexibility and choice. Take advantage of the capabilities of HPE ProLiant servers or the

Integrity Superdome X and fit them into your existing infrastructure. HPE offers a range of consulting services that can help you meet your specific needs, reduce risks and empower your IT organization to own and manage your SAP HANA environment.

SUSE Linux Enterprise Server for SAP Applications and TDI

In addition to the features that add value to Superdome Flex and ConvergedSystem solutions, the TDI option allows you to take advantage of even more of SUSE Linux Enterprise Server for SAP Applications.

SUSE Linux Enterprise Server for SAP Applications comes with a high-availability extension that allows you to cluster physical servers, virtual guests or any combination of the two. Its easy-to-use GUI makes cluster configuration and management simple. It even has a cluster simulator, which lets you test and validate configuration changes before implementing them.

SAP HANA has a business continuity architecture that replicates the in-memory data so administrators can initiate failover to a backup in case of a primary system failure. SUSE Linux Enterprise Server for SAP Applications enhances this capability by providing resource agents that automate that failover action. This means that failover happens without needing an action from the administrator, so systems stay up and running even when your IT team is focusing on other projects.

SUSE developed the two resource agents involved and currently supports failover automation for all common scale-up and scale-out SAP HANA scenarios. You can find best practices for mission-critical SAP applications, including setup guides for system replication, at SUSE.com here.[8]

In SUSE Linux Enterprise Server for SAP Applications, we have created an SAP HANA system-specific firewall. This can help prevent unauthorized access to your SAP HANA system and the valuable data that resides in it. We also offer 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.[9]

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8 **www.suse.com/products/sles-for-sap/resource-library/sap-best-practices/**
9 **www.suse.com/docrep/documents/wvhlogf37z/os_security_hardening_guide_for_sap_hana.pdf**

The SUSE operating system also makes it easier to get started with SAP HANA and keep your system up to date. Time-saving features include an SAP application installation wizard with tuning parameters and an installation configuration package that allows you to quickly and accurately configure SAP applications for optimal performance. You also get a dedicated update channel that delivers SAP-specific operating system updates.

Solution Enhancements

Whether you chose a Superdome Flex, ConvergedSystem or TDI solution, SUSE offers enhancements that can help you maintain uptime and ease the management of your solution.

SUSE Linux Enterprise Live Patching

SUSE Linux Enterprise Live Patching is an open source solution that delivers live kernel patching for critical updates without the need to reboot. The subscription-based extension of SUSE Linux Enterprise Server for SAP Applications provides access to Linux kernel fixes released in the last 12 months.

It relies on kGraft and technology and ideas already familiar and present in Linux. The solution places code in a function's header to reroute calls to the patched function. The function in question is patched without applications being affected. For an in-memory database like SAP HANA, where downtime and latency are major issues, SUSE Linux Enterprise Live Patching can provide an enormous benefit. It helps you 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

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"We work with SUSE in a variety of ways, most notably on the R&D side. We have a deep relationship that goes back all the way to our open source roots."

SCOTT FARRAND
VP of Platform Software
HPE

and regain control of IT assets by enabling comprehensive management of multiple Linux distributions, systems, virtual machines 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 it allows you to organize your Linux servers into logical groupings for easier management. With functions that include automated Linux server provisioning, compliance reporting and patching to configuration management of tens of thousands of servers, SUSE Manager helps you reduce costs, streamline operations and improve compliance and service quality.

You can find a setup guide for managing SAP HANA in a scale-out environment using SUSE Manager here.[10]

SUSE also offers the SUSE Manager Management Pack for Microsoft System Center Operations Manager. This enables administrators to manage your SUSE Linux systems and the HANA appliance from the Microsoft System Center console they already know. The management pack can reduce headaches and improve administrator productivity as you transition to Linux or operate your mixed data center.

SUSE and HPE: Helping SAP HANA Provide Agility and Insight

Drive your enterprise forward and take advantage of all the benefits of SAP HANA with a solution that addresses your technical challenges. With SUSE and HPE's more-than-25-year partnership and long working history with SAP, you get peace of mind from knowing that you're partnering with industry leaders that work together well. Power your SAP HANA implementation and your organization's future with SAP HANA solutions from SUSE and HPE.

Learn More

Learn more about how SUSE and HPE can simplify your SAP HANA deployment and operations at **www.suse.com/hpe** or by contacting **hpeteam@suse.com**.

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10 **www.suse.com/promo/sap/hana/suse-manager-scale-out/**