SUSE

Be Prepared to Transform the SAP Core Infrastructure

Introduction

What does a move to SAP HANA mean for your infrastructure? If you want to get the most from your HANA migration, pay attention to the the foundation for your SAP environment.

The SAP HANA database and business applications offer a powerful path to increased efficiency and better business intelligence, but SAP's software products are only part of the solution. Your SAP environment rests atop a core set of services and infrastructure. If you want your transition to SAP HANA to go smoothly, you'll need to be prepared with a versatile and well-integrated infrastructure that includes operating systems, drivers, virtualization tools, orchestration and management components, plus all the rest of the software infrastructure underpinning your SAP environment.

Getting Started

The starting point for your SAP core infrastructure is Linux because SAP HANA only runs on Linux systems. Choose an open source vendor with a good reputation for SAP support but then take a closer look at the surrounding landscape.

SAP's HANA environment is an advanced database solution that leverages a diverse combination of data sources and deployment technologies. You'll need an infrastructure that supports the full range of SAP features and leaves room for future expansion and evolution.

When you build your SAP core infrastructure look for a solution that provides:

- Software-defined infrastructure
- Application delivery
- Lifecycle management
- High availability
- Advanced data tools
- Automation
- SAP affinity

If you are thinking about implementing SAP HANA, or if you are upgrading to HANA from a legacy SAP configuration, prepare for your migration by addressing these critical requirements.

Software-Defined Infrastructure

The SAP business suite is designed to adapt to changes in your organization. SAP applications work best in a self-managing, self-healing environment that minimizes manual intervention. Software-defined infrastructure (SDI) is a collection of technologies that emphasize the fluidity of the software environment. The goal is a system where the software operates independently of the hardware, adapting to changing conditions with minimal human touch. Another goal of SDI is to reduce system downtime; service interruptions can cause missed opportunities and data loss issues. SAP designs many of their tools for continuous operation. You should design your core infrastructure for the fluidity and uptime emphasis embodied in SDI.

Some of the technologies that fall within the realm of SDI include:
- Cloud computing
- Virtual compute, storage and networking
- Linux operating system

No technology reflects the drive for greater flexibility more than cloud computing. Whether your cloud operates on premises or in a public space, the automated orchestration capabilities of the cloud keep you competitive, enabling your infrastructure to respond dynamically to changing needs.

SAP is investing heavily in the cloud. The SAP Cloud Platform, HANA Enterprise Cloud and other initiatives put the emphasis on fast, flexible service delivery for SAP systems. Whether your organization uses a public or private cloud (or both), you'll enhance the longevity and versatility of your SAP environment by providing strong cloud support.

System rollback is a feature of the operating environment that you hope you won't need, but if you do, you'll be glad it's there. Downtime can mean lost revenue and productivity within a business-critical SAP landscape. A rollback mechanism in the Linux OS enables you to quickly reset the configuration if something goes wrong. Be sure that your core infrastructure provides a means for system rollback. A snapshot-based rollback solution also has another important benefit: it enables you to clone a working system for easier backup and expansion.

Application Delivery

With modern enterprise IT operations, containers play an important role in deploying applications and services.
A well-designed container system offers many of the flexibility benefits associated with a private cloud—often with better performance and more efficient resource usage. SAP is building solutions for delivery in containers, so your core infrastructure will need strong container support if you are planning on a long-term solution for SAP.

In particular, the Kubernetes container orchestration tool is a valuable asset for your SAP environment. Kubernetes plays a role in SAP's Data Hub data management applications; and SAP has even started deploying the HANA database in a container for more efficient provisioning in cloud and DevOps continuous delivery deployments.

Lifecycle Management

Lifecycle management is a technology that grew out of the continuous integration revolution. The goal is to use a single tool to manage the complete lifecycle of application testing, deployment, configuration and upgrade. SAP provides the product lifecycle management (PLM) tool for managing the lifecycle of SAP applications and components. For uniformity and ease of management, you should find a solution that applies the same lifecycle philosophy to your core infrastructure. An automation emphasis in the management environment is important for minimizing overhead, maximizing control and ensuring audit-ready compliance for SAP systems.

Application upgrade and package delivery is theoretically part of lifecycle management, but it warrants special mention because of its importance—and because it is treated separately in some environments. The importance of continuous operation within the SAP environment requires a solution that delivers upgrades smoothly from a secure and verified source with minimal disruption to ongoing operations.

High Availability

SAP applications are designed for continuous operation, but the built-in high availability features won't help if the underlying network components and services don't offer similar protection from downtime. A well-designed core infrastructure integrates SAP HANA system failover and recovery capabilities with OS-level high availability tools. This support should include early recognition for primary system failures, as well as automated switching from primary to secondary systems.

Advanced Data Tools

The primary purpose of the SAP business application suite is to collect, manage and analyze data in order to gain insights for your organization. Consequently, data is important to SAP. The SAP HANA in-memory database is at the heart of the SAP environment and is the first stop for ensuring an efficient and seamless core infrastructure Most buyers are aware of the need to ensure that they have the compute, memory and storage resources necessary to support HANA. It is also important to ensure that the operating system at the foundation of your core infrastructure is tuned for large-memory operations and has sufficient capacity to manage the demands of SAP HANA.

Many environments benefit from hosting SAP HANA with persistent memory solutions like non-volatile dual in-line memory module (NVDIMM) hardware, or virtual PMEM solutions. Conventional RAM is volatile, meaning that the data is lost after a power outage or system reboot. When SAP HANA starts in a volatile memory environment, it must copy the database contents from a persistent storage source, which leads to a slower startup process. This can take several hours for large databases. On the other hand, persistent memory solutions for SAP HANA reduce the startup time needed for an operational system. If you are thinking about exploring the benefits of persistent memory for your SAP HANA implementation, be sure that the OS running in your core infrastructure has support for memory solutions that are validated by SAP.

You'll also need to pay attention to the security of remote storage devices if you are implementing SAP applications in the enterprise. Within many enterprise-level SAP landscapes, computers must fetch a key or certificate to unlock volumes automatically or storage must be unlocked manually after system restarts. This assumes that the storage is encrypted to prevent unauthorized access of business data. If you already protect your resources through encrypted key exchange, a key server that supports the Key Management Interoperability Protocol (KMIP) gives you the greatest flexibility for interoperability.

SAP's Data Hub technology enables you to create data pipelines and integrate data from different sources into a unified environment. As previously mentioned, SAP Data Hub is only delivered in containers and requires a core infrastructure that supports the Kubernetes container management platform.

SAP Data Hub also creates opportunities for efficiency and cost savings, if it is deployed wisely with the underlying enterprise environment. The integration provided through SAP Data Hub offers the possibility for cost savings through a tiered storage environment—where low-latency data resides on a solid-state medium and higher-latency data is managed through a software-defined object storage system, such as Ceph. Visualize your data usage and imagine how your needs will change over time. Then build a core infrastructure that will exploit the possibilities provided by SAP Data Hub and SAP S/4HANA.

Automation

Today's IT operations can benefit from automation. The complexity of modern computer systems, the decline in IT budgets and the increased need for systematic security all lead to an environment where humans focus on exceptions and special assignments, and on implementing automation for routine maintenance tasks. SAP designs its business applications to promote continuous operation and reduce administration time. Organizations can realize the administration savings associated with this automation emphasis if the underlying system also reflects this self-management paradigm. Look for a solution with advanced automation capabilities. This has the added benefit of enabling you to redirect your highly skilled IT staff to focus on new service delivery rather than routine maintenance.

SAP Affinity

As you consider a solution for your SAP core infrastructure, be aware of the difference between:

- Passive support: a general state of compatibility.
- Active support: an ongoing state of preparation and readiness

Does the solution merely accommodate SAP software as another application on a general-purpose OS, or does it reach out to form a tuned, seamless and well-tested connection? Ask whether the system has been optimized for SAP workloads—and test the system yourself to see if the performance meets your expectations. Are installation and configuration tools available to flatten the learning curve and reduce deployment expense? Does the vendor provide SAP-specific packages and cloud images for easy orchestration and upgrade? Does the vendor offer transition support and ongoing support services? If so, do they have a proven history of success with supporting SAP?

Take the time to study the possible solutions. Ask for case studies and references from previous clients to ensure that the vendor has the knowledge and experience to back up their promises.

SAP on SUSE

SUSE® is a leading open source vendor that has had a close relationship with SAP for over 20 years. SUSE supports an open environment, with open source tools and APIs, for permanent protection from the complications of vendor lock-in. SAP HANA was actually developed from the ground up on SUSE Linux Enterprise Server. SUSE currently supports about 90 percent of all SAP HANA deployments around the world.

SUSE Linux Enterprise Server for SAP Applications is a specialized version of SUSE Linux Enterprise Server that SUSE engineers designed and optimized to serve as part of the core infrastructure for your SAP environment. SUSE Linux Enterprise Server for SAP Applications comes preloaded with the tools you'll need to anchor your SAP environment, such as high availability, persistent memory support and remote storage encryption management.

SUSE also provides full support for Kubernetes, Ceph, lifecycle management with Spacewalk and Salt and the other tools you'll need for a versatile and fully integrated core infrastructure Table 1 summarizes how the SUSE environment tools match up with the checklist for your SAP environment SUSE Linux Enterprise Server

for SAP Applications comes with preconfigured parameters for optimum SAP performance on Linux. SUSE worked in partnership with Hyperscalers to deliver public cloud platform images that are customized and tuned for easy deployment in SAP HANA and SAP S/4HANA cloud environments. SUSE also offers comprehensive transition support and a range of options for ongoing maintenance and technical services.

Preparing for SAP HANA

SAP HANA and the SAP S/4HANA business toolkit offer an exciting vision of analytics and intelligence that will help your business maintain a competitive edge. However, as you begin to explore the SAP environment, pay attention to the rest of the solution. If you want to get the most from your SAP investment, you'll need a well-designed and well-equipped core infrastructure that grows gracefully and evolves with your needs.
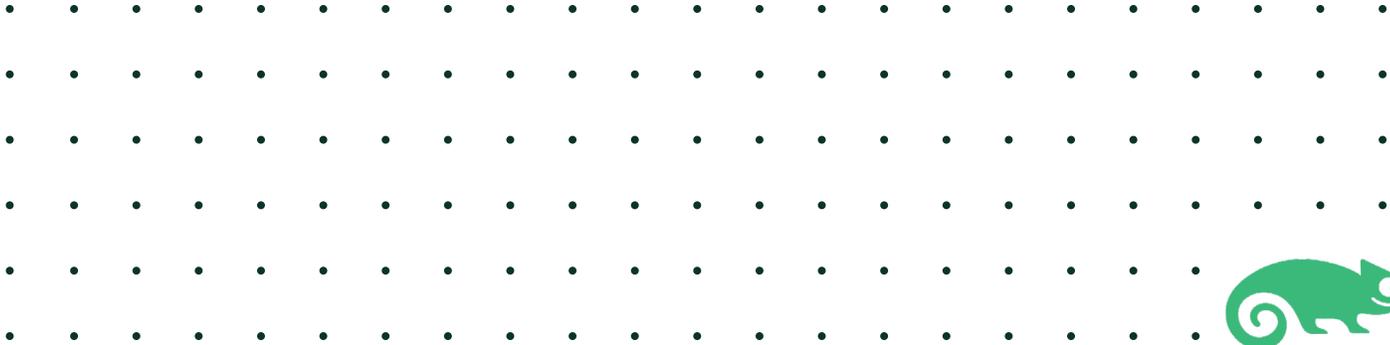
The experts at SUSE will help you be prepared with a versatile, economical and well-integrated SAP core infrastructure

Table 1: SUSE support for an SAP core infrastructure

Software-Defined Storage	
Cloud	SAP cloud deployment templates for several leading hyperscalers
Automated upgrade and software delivery	Automated channeled-based upgrade and software installation through SUSE Manager
System rollback	Snapshot-based system rollback and cloning built into SUSE Linux Enterprise Server for SAP Applications
Application Delivery	
Containers	Container management by Kubernetes with SUSE CaaS Platform
Lifecycle Management	
Automation-focused lifecycle management	Complete solution with deployment, monitoring, auditing and configuration through SUSE Manager
High Availability	
Server high availability	Choice of multiple HA/DR scenarios with SUSE Linux Enterprise Server for SAP Applications, including support for Relax and Recover (ReaR) on all platforms and early recognition of system failures
Automated SAP HANA failover	Enhances SAP HANA System Replication capabilities by automating the process of switching from a primary system to a secondary system and handling fencing through STONITH
Advanced Data Tools	
Persistent memory for SAP HANA support	Supports both Intel Optane(tm) DC NVDIMMs and IBM PowerVM(tm) virtual PMEM
KMIP-compliant encryption key server	Included
SAP Data Hub support	SUSE CaaS Platform is fully validated as a Data Hub platform
Software-defined storage	Ceph-based software-defined storage with SUSE Enterprise Storage

Additional contact information and office locations:
www.suse.com

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