White Paper

Modernizing an SAP Landscape Requires an Open Source Provider for Hybrid Cloud, Cloud-Native Application Development, and Automation

Sponsored by: Red Hat

Greg Macatee Peter Rutten
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IDC OPINION

Businesses across industries are confronted with many factors that influence their ability to operate successfully and profitably, including escalating geopolitical tensions, global economic fluctuations, high interest rates, inflation, increasing cost of operations, sustainability issues, and stringent regulatory requirements. At the same time, they must manage continuous change and protect their margins on various fronts: with regard to the technologies they leverage, the products and/or processes they develop, the competitive landscape in which they operate, and the regional economies that they participate in.

One way to better achieve business goals in the dynamic mix of influencing factors is by modernizing the enterprise resource management environment on which the business operates. For organizations with SAP software, this means moving to SAP HANA and SAP S/4HANA in a hybrid cloud model. Such a modernization opens up new opportunities to predict and act on a variety of real-time business data and thus advance the organization's business goals more proactively and comprehensively.

When starting such an endeavor, businesses should be aware that the open source provider for an SAP landscape plays a critical role in managing the landscape. Modernizing an SAP landscape system without disrupting operations is a challenging task, one that is fraught with risk. Organizations typically initiate multiple-step projects that can take anywhere from 3 to 18 months and that require multiple decisions, including infrastructure choices, operating system (OS), and cloud versus on premises. Within this journey, the open source platform choice should be carefully evaluated as the open source provider for an SAP landscape plays a critical role.

The open source provider must enable customers to run SAP in a performant, secure, and compliant way with high availability. It needs to enable them to easily and seamlessly manage the SAP infrastructure while automating across hybrid environments. And it should allow them to develop, deploy, and manage SAP side by side applications, giving developers what they need to innovate and extend SAP functionality.

Organizations should also look for a variety of capabilities: fast deployment and change management, downtime prevention, hybrid cloud simplicity, governance management, policy-based control, and self-service functionalities, as well as a homogeneous, easy-to-manage environment, whether that is on premises, in the cloud, or both (including multicloud).

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IDC believes that there are compelling reasons for organizations to consider Red Hat for these capabilities in order to standardize, automate, and modernize their SAP landscapes.

SITUATION OVERVIEW

IDC predicts that by 2024, 50% of all IT spend will be for digital transformation and innovation while more than 50% of organizations will be leveraging multicloud deployments to realize their digital transformation strategies. Furthermore, by 2024, 80% of all new applications will be deployed as containers, even as SAP HANA and SAP S/4HANA will not be containerized. Within this mix of fundamental changes, SAP customers need to ensure that their critical SAP workloads continue delivering business value in the most seamless and integrated fashion.

In the past several years, SAP has been innovating hundreds of its offerings while urging its customers to migrate to SAP HANA and S/4HANA. Furthermore, the software company has been promoting multicloud as the preferred deployment strategy for its solutions with an increasing focus on integrating SAP and non-SAP environments. At SAP TechEd 2023, SAP discussed its robust multicloud strategy and its collaboration with major could services providers (SPs), including Amazon Web Services (AWS), Google Cloud Platform (GCP), and Microsoft Azure. For CIOs and CTOs this means that they need to consider a complex set of variables with regard to the SAP strategy as part of their digital transformation journey. One of these decisions pertains to the open source provider for their SAP landscapes. IDC recommends that organizations select a provider based on three criteria:

- **Datacenter efficiency and hybrid cloud management.** This is about fast deployment and change management, downtime prevention, hybrid cloud simplicity, governance, policy-based control, and self-service functionalities.
- **Integration and new solution development.** This is to give developers what they need to innovate and extend SAP functionality.
- **Automation.** This pertains to the ability to automate SAP-related enterprise IT operations such as provisioning, application life-cycle management, and network operations.

The sections that follow will take a deeper look at these requirements.

Considerations for Selecting an Open Source Provider for SAP

Datacenter Efficiency and Hybrid Cloud Management

Organizations should look for a variety of capabilities: fast deployment and change management, downtime prevention, hybrid cloud simplicity, governance, policy-based control, and self-service functionalities. Most likely, they will want to streamline their operations across several business units in a cost-saving way that results in a less heterogeneous and easier-to-manage environment, whether that is on premises, in the cloud, or both (including multicloud). Some important expectations from the open source provider would be:

- **Support for hybrid cloud environments.** Hybrid cloud platforms provide enterprises the flexibility to run select components of their SAP deployments and applications across on-premises and public cloud environments. For example, they can run their SAP applications and databases on public cloud and on premises. IDC observes that enterprises are increasingly leveraging hybrid cloud platforms for their SAP landscape. An ability to support and manage hybrid cloud environments consisting of on premises and public cloud is hence a critical ask from the underlying operating system.

- **Consistency in the datacenter.** Businesses want to achieve a consistent platform from an operating ecosystem point of view that can help them seamlessly migrate their SAP environment, no matter whether they are deploying from bare metal or virtualized servers to private, hybrid, or public cloud, and harmonize SAP and non-SAP workloads so that SAP workloads work well with non-SAP workloads and simply run as an extension of the entire environment.
- **Performance of the SAP applications.** The operating system can help boost the performance of SAP workloads, for example, through optimizations that have been developed with a server vendor.
- **High availability (HA) and data recovery.** SAP HANA, SAP S/4HANA, and other SAP applications are running business-critical workloads that demand robust high availability and disaster recovery (DR). HA can be achieved in a myriad of ways, all the way from processor features to hardware redundancy to clustering and failover software.
- **Seamless upgrades, live patches, and fixes.** With downtime expectations approaching zero for SAP workloads in today's 24 x 7 world, capabilities such as live kernel patching — patching a kernel without taking the system offline — are critical operating system capabilities, as are features such as enabling upgrades and fixes with no or minimal disruption.
- **Server OEM partners.** While both Linux distributions for SAP are available on all the solutions that server OEMs offer, the different operating system vendors have different relationships with those server OEMs that can benefit their customers, for example, when it comes to reference architectures, optimizations, or enabling specific SAP solutions to run on the broader operating ecosystem.
- **Predictive analytics on the OS.** Continuous monitoring of the SAP environment is a cornerstone of the automation and seamless management of an integrated SAP platform while preventing issues with security, networks, system configurations, and other aspects of the landscape.
- **Regulatory compliance.** Enterprises have substantial compliance requirements based on the industry vertical, type of customers, geographic location, and more. Such requirements may need specific security certifications, cryptographic modules, and support for encryptions. The open source provider should be able to support such requirements with automation and provide an easy way to set and validate compliance policies.
- **Support.** Enterprises care about business continuity. With SAP deployments, enterprises typically encounter multiple infrastructure abstractions, deployment locations, and technologies. Troubleshooting downtimes in such environments is not trivial. Enterprises are better served by a single point of contact that is integrated with SAP support in such situations.

Integration and New Solution Development

Businesses consider it fundamental that SAP and non-SAP applications and data are integrated to improve the data quality and enrich the business insights they can derive from them. With new technologies such as artificial intelligence (AI) or IoT becoming competitive drivers, businesses need a platform like SAP Datasphere that combines integration, orchestration, metadata management, and connectivity with SAP AI Business Services machine learning in the cloud to help IT and data science teams collaborate. Some important expectations from the open source provider would be:

- **Integration with SAP Business Technology Platform (BTP).** SAP Business Technology Platform is a technology platform that brings together data and analytics, artificial intelligence, application development, automation, and integration in one unified environment — from on premises to cloud. BTP is a software-as-a-service (SaaS) environment that connects to on-

premises and cloud-based systems running other SAP software. Depending upon the operating system, it is available from various cloud SPs that offer SAP solutions.

- **Containerization.** Businesses are increasingly deploying containerized custom applications integrated with SAP's "Digital Core." IDC has found that nearly one-third of organizations extensively use the containerization features of their open source provider for SAP[1]. All major operating systems currently support container runtimes and container orchestration platforms. Nevertheless, the key differentiation is the ability to provide enhanced security to containerized applications and enable more accessible access to accelerated hardware capabilities such as GPUs.
- **Support for emerging data persistence technologies.** Modern applications such as containerized/cloud-native applications, microservices applications, and AI/ML applications have different data persistence requirements than traditional enterprise applications. Streaming platforms (such as Apache Kafka) and in-memory databases (such as SAP HANA) also have specific data persistence needs. The underlying operating system needs to support such data persistence requirements through various constructs such as persistent volumes (for containerized applications), log volumes and data volumes (for SAP HANA), and high-performance message queues (for streaming applications).

Automation

- Automation means the ability to automate enterprise IT operations such as provisioning, application life-cycle management, and network operations through programmatic methods, including configuring SAP HANA landscapes.
- Automation is also important for executing automated system software upgrades without any disruptions to the environment.

CONSIDERING RED HAT FOR SAP WORKLOADS

Since its inception, Red Hat and SAP have worked together to build out a multitude of offerings around supporting SAP workloads, and over the past several years, the two companies have only further deepened their partnership. In February 2023, SAP and Red Hat announced an expanded partnership to significantly increase SAP's use of and support for Red Hat Enterprise Linux. This collaboration aims to enhance intelligent business operations, support cloud transformation across industries, and drive holistic IT innovation, according to the partners.

When deploying Red Hat solutions for their SAP workloads, customers can expect to achieve the following benefits:

- **Application life-cycle support:** Red Hat and SAP work together to deliver support for customers' environments. In addition, for customers planning to upgrade their Red Hat Enterprise Linux versions during their SAP life cycles, they have access to Red Hat's Update Services when planning on modernizing their IT environments and updating to minor version releases of Red Hat Enterprise Linux.
- **Platform standardization:** By standardizing on Red Hat commercial products, customers can expect to achieve consistent levels of performance whether creating or growing their IT environments on premises, in the public cloud, or in other hybrid cloud and multicloud

[1] *IDC Special Report: Infrastructure Adoption Trends for SAP HANA and S/4HANA 2021*

environments. Furthermore, Red Hat products in support of SAP workloads can all be delivered over the same single subscription model that can be easily tracked by customers internally within their businesses.

- **Efficient automation:** This includes Red Hat Enterprise Linux system roles for SAP to install, configure, and manage customer Red Hat Enterprise Linux environments, which can also be used in tandem with Red Hat Ansible Automation Platform for customers to automate their infrastructure more seamlessly.
- **Proactive tools:** Red Hat Enterprise Linux for SAP Solutions includes Red Hat High Availability Add-on and high-availability solutions for SAP. Red Hat Enterprise Linux for SAP Solutions (as well as all other Red Hat Enterprise Linux subscriptions) also comes with Red Hat Insights, which is a tool that allows for better user visibility into their environments and that can track risks and overall IT performance according to SAP rules and policies.
- **Continuous availability:** Customers of Red Hat Enterprise Linux for SAP Solutions with Red Hat High Availability Add-on can deploy their SAP solutions in highly available scale-up and scale-out configurations of their choosing. Moreover, in ensuring higher levels of availability, Red Hat Enterprise Linux has built-in live kernel patching and in-place upgrades that prevent system downtime while updating enterprise operating system environments.
- **Enterprise-grade performance:** There are several ways in which Red Hat Enterprise Linux for SAP Solutions customers can improve and lower their total costs of ownership (TCOs) that include SAP-specific performance tunings, PMEM, File System Data Analysis Expressions (FS-DAX), and Virtual PMEM on IBM Power.

Red Hat Solution Portfolio for SAP

Over the past several years, Red Hat has continued to pitch its vision to enterprise customers of a powerfully capable yet dynamic and flexible IT infrastructure platform built on RHEL, Ansible, and OpenShift, which can be deployed on premises, in the cloud (private or public), or at the edge in support of their workloads. IDC sees this as a message that has resonated well with the company's customers, particularly as IT markets have pivoted toward increasingly hybrid cloud and multicloud deployment models. By engaging with companies such as Red Hat, customers have access to the requisite commercial infrastructure software platforms and levels of support needed to serve as building blocks of their broader stacks that drive successful outcomes and create value.

Red Hat, in support of organizations' business goals, continues to further build around its core product ecosystem by strategically partnering and furthering long-standing relationships with other ISVs such as SAP. Red Hat's three corporate pillars align with SAP and Red Hat's solutions portfolio can be viewed most effectively based on those pillars:

- **Run SAP.** Manage a hybrid cloud infrastructure by scaling, managing, and focusing on secure foundations for traditional and cloud workloads across all environments
- **Extend SAP.** Enable cloud-native development by developing, deploying, and managing any application, on any environment, giving developers what they need to innovate
- **Simplify SAP.** Manage Red Hat platforms and automate across hybrid environments smoothly and efficiently

Run SAP

This pillar reflects Red Hat's capabilities to run both SAP and non-SAP workloads on the same Linux OS across multicloud environments.

Red Hat Enterprise Linux

Red Hat Enterprise Linux is the flagship product and operating system offered by Red Hat. As tracked by IDC research, Red Hat Enterprise Linux is the commercial Linux market segment's leading product in terms of sales, with roughly an 80% market share as of the end of 2022 in addition to possessing quite a large user installed base. As a pioneer of commercial open source software, Red Hat has 30 years of experience in the space, which has provided the company with ample experience in developing and adapting its products to meet the needs of customers in an ever-evolving IT landscape.

Regardless of where customers are in their digital and modernization journeys, they can expect to achieve the following benefits with Red Hat Enterprise Linux:

- **Commercially hardened software:** Red Hat rigorously tests Red Hat Enterprise Linux code to ensure it operates robustly, scales appropriately, and functions as expected. It also makes enhancements to the Linux kernel's open source code to provide additional layers of security and stability in Red Hat Enterprise Linux when comparing the operating system with alternative community distributions. Further, Red Hat Enterprise Linux is well-integrated with the rest of Red Hat's product portfolio, which can help customers more seamlessly manage their IT environments.
- **A secure and flexible foundation for IT:** From the core to the cloud, and to the edge, Red Hat Enterprise Linux offers the same performance-rich experience for users that spans the spectrum of hardware architectures (e.g., x86 and non-x86, including Arm, IBM Power, IBM Z, and IBM LinuxONE).
- **Enterprise-grade support:** The value of enterprise-grade support cannot be overstated, particularly as users' IT environments become more distributed and complex. In fact, our research shows Red Hat's commercial support is one of the company's key value propositions according to its customers. While the debate between free, community-driven Linux and commercial Linux wages on, many users of noncommercial Linux distributions often fail to recognize and account for the implicit costs of increased staff time spent managing, updating, and patching their environments in addition to other opportunity costs.
- **A clear product road map and predictable upgrade path:** While the community-supported OS ecosystem can be unpredictable and, at times, unwieldy, Red Hat rolls forward previous OS builds and features into current versions while ensuring compatibility with older APIs and other software dependencies. All major Red Hat Enterprise Linux versions also have a 10-year life cycle so organizations can plan ahead and update their operating system environments only when they are truly ready to do so.
- **A wide partner network of hardware, software, and services providers:** This includes a variety of Red Hat hardware partners including (but not limited to) IBM, Dell, Hewlett Packard Enterprise (HPE), and Intel, as well as major public cloud services providers such as Amazon Web Services, Microsoft Azure, and Google Cloud Platform.

In addition, readers should note that all Red Hat Enterprise Linux subscriptions are bundled with Red Hat Insights (Red Hat Insights also comes bundled with the Red Hat OpenShift and Red Hat Ansible Automation Platform products, to be discussed later in this document). Red Hat Insights allows operations teams to analyze their IT environments through a single dashboard and SaaS interface, and it provides recommendations to help users track performance and costs in addition to identifying the potential security risks, vulnerabilities, and misconfigurations of their Red Hat footprints.

Extend SAP

This pillar reflects Red Hat's capabilities to extend SAP Core functionality with innovative business applications built on the Red Hat Kubernetes container platform.

Red Hat OpenShift

Red Hat OpenShift is an enterprise-grade, certified Kubernetes container orchestration platform to build, deploy, and manage containerized applications. Red Hat OpenShift can be consumed as a fully managed service on different cloud service providers or can be self-managed by a customer using Red Hat OpenShift Container Platform or Red Hat OpenShift Kubernetes Engine. Red Hat OpenShift can be deployed on premises, on bare metal servers, on virtualization platforms (e.g., Red Hat Virtualization, VMware, or Red Hat OpenStack Platform), or on major public cloud services providers such as Amazon Web Services, Microsoft Azure, and Google Cloud Platform. In addition, Red Hat Advanced Cluster Manager for Kubernetes can be used to manage multiple Red Hat OpenShift clusters and applications from a single console with built-in security policies, which can enable customers on an open hybrid cloud.

Red Hat OpenShift Container Platform supports deploying and managing both containerized applications and virtual machines (VMs) through Red Hat OpenShift Virtualization, and it is integrated with the Red Hat Virtualization platform. Red Hat OpenShift Container Platform also provides the flexibility of using the complete Red Hat Enterprise Linux OS or a smaller, container-oriented OS called Red Hat Enterprise Linux CoreOS.

By bringing the strength of a commercially supported Kubernetes distribution to microservice architectures, containerization, and the DevOps model of SAP's future digital enterprise, businesses can benefit from leveraging their own Red Hat OpenShift Container Platform instance with isolated data, storage, and network environments to adhere to their data security, privacy, and protection needs.

Simplify SAP

This pillar reflects Red Hat's capabilities to run and maintain an SAP landscape leveraging Ansible Automation for day 1 and day 2 operations. It also includes Red Hat's RISE with SAP suite with RHEL, a cloud-ready infrastructure software platform aimed at easing organizations' paths into the cloud for S/4HANA.

Red Hat Ansible Automation Platform

Red Hat Ansible Automation Platform enables scalable and secure automation of various aspects of enterprise IT operations, including resource provisioning, application life-cycle management, and network operations. It consists of Ansible Engine, Ansible Tower, and Ansible Hosted Services. All other products in the Red Hat portfolio can be integrated using the Red Hat Ansible Automation platform. In addition:

- Red Hat Ansible Automation Platform enables consistency in the datacenter by providing programmatic methods to deploy, manage, and secure infrastructure resources. Red Hat Ansible Automation Platform also enables the community to share best practices through modules called "playbooks."
- Red Hat Ansible Automation Platform provides a wealth of SAP-specific roles for automating SAP HANA landscapes. It provides configuration of SAP HANA landscapes and Red Hat infrastructure. In combination with Red Hat Enterprise Linux for SAP solutions, Red Hat

Ansible Automation Platform makes it possible to automate critical transitions like system software upgrades with near-zero downtime.

RISE with SAP with RHEL

Through the expanded partnership between Red Hat and SAP, SAP customers choosing to deploy RISE with SAP on Red Hat will be afforded a capable and cloud-ready infrastructure software platform aimed at easing their paths into the cloud (as well as between clouds). In addition, these customers will have access to other Red Hat infrastructure management and automation tools, such as Ansible, to help streamline their RISE with SAP environments and allow them to unlock the full value of their IT investments.

RISE with SAP was launched in early 2021 as SAP's response to the hurdles that SAP customers were facing with their migrations to SAP S/4HANA and their move to the cloud. The program is a commercially bundled, single-subscription contract that provides SAP customers access to a collection of tools, services, and software to help them with their business transformation. It has been designed to simplify the move to SAP S/4HANA and allows businesses to step back from managing complex IT infrastructures for SAP S/4HANA.

RISE with SAP includes SAP S/4HANA Cloud (which is a SaaS version of SAP S/4HANA), technical managed services, business process intelligence, SAP Business Technology Platform, SAP Business Network, and services for several specific industries.

CHALLENGES/OPPORTUNITIES

For Businesses

Choosing an open source provider for SAP workloads is a critical part of the many decisions that businesses have to make when they modernize their SAP landscape. Businesses should look beyond the immediate OS and consider the entire platform that their SAP workloads will be running on and interacting with. This should be a comprehensive platform for private cloud, hybrid cloud, public cloud, and multicloud that delivers interoperability, orchestration, and automation.

For Red Hat

Red Hat faces competition in the SAP market from a single competitor, which is also working closely with SAP. But Red Hat's partnership with SAP and SAP's drive to the cloud, including the company's push to position SAP Business Technology Platform as the de facto platform for developing, integrating, and extending new applications in the cloud, are major opportunities for Red Hat, given Red Hat's OpenShift platform. Both SAP and Red Hat, and ultimately their shared customers, will benefit from these developments.

CONCLUSION

The open source provider for an organization's SAP landscape is a critical component of how the organization modernizes its SAP environment as part of its digital transformation journey.

Businesses need to make sure that with the open source provider, they can deliver a consistent platform for migrating an SAP landscape from bare metal or virtualized servers to private cloud, hybrid cloud, or public cloud; performance improvements from the operating platform for SAP HANA or SAP

S/4HANA; integration with SAP Business Technology Platform; and robust high availability and disaster recovery.

The open source provider also needs to provide seamless upgrades, live patches, and fixes; strong reference architectures and optimizations; predictive analytics for preventing security, network, and system configuration issues; and virtualization technologies for utilization and resource consolidation.

And, finally, the open source provider should provide containerization for scalability and operational efficiency, with enhanced security access to accelerated hardware; a hybrid cloud platform to run SAP applications across on premises, public cloud, and multicloud; support for new data persistence technologies and for software-defined storage; a complete portfolio of regulatory compliance; and a single point of contact for troubleshooting support.

IDC believes that Red Hat Enterprise Linux for SAP Solutions provides a powerful solution set to deliver these capabilities to businesses.

About IDC

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Global Headquarters

140 Kendrick Street
Building B
Needham, MA 02494
USA
508.872.8200
Twitter: @IDC
blogs.idc.com
www.idc.com