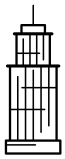
RED HAT®
ENTERPRISE LINUX®

TRANSFORM YOUR SAP HANA ENVIRONMENT WITH INTEGRATED SOLUTIONS FROM RED HAT AND IBM

PARTNER SOLUTION OVERVIEW



Red Hat Enterprise Linux running on IBM Power Systems—hardware designed to mitigate risk—offers the highest availability among major server and operating system platforms.

INTRODUCTION

Organizations are increasingly deploying data-intensive, real-time workloads on SAP® HANA®. These workloads require a robust, multisocket server architecture with scale-out and scale-up capabilities. In addition, IT platforms running SAP HANA should offer the flexibility to meet both current and future needs—with options to run multiple and mixed workloads, expand system capacity, and deploy SAP HANA in on-premise, cloud, or hybrid environments.

An integrated solution from IBM, SAP, and Red Hat offers a comprehensive hardware and software foundation for SAP HANA workloads. IBM Power® Systems are specifically designed to deliver necessary hardware flexibility, resilience, and high performance. SAP HANA on Red Hat® Enterprise Linux® for SAP Solutions for Power, LE combines IBM's advanced server capabilities with the leading enterprise Linux operating system to help organizations take full advantage of their SAP HANA investment.

ENTERPRISE I.T. FOUNDATION FOR SAP WORKLOADS

Red Hat and IBM have partnered with each other and SAP for more than 15 years, creating integrated, proven solutions for enterprises through intensive co-engineering efforts. Together, Red Hat and IBM offer greater flexibility for enterprises to use multiple architectures—including IBM Power Systems—within their datacenters to establish a single, consistent operating system to run big data SAP workloads.

ACHIEVE ENTERPRISE-GRADE PERFORMANCE

SAP customers use applications running on SAP HANA to gain real-time insights and faster business results. Performance is critical. IBM Power Systems provide substantially better performance compared with other architectures.[1]

Designed specifically for big data workloads, IBM Power Systems feature simultaneous multithreading to execute more threads per core than x86-based servers and handle more instructions per clock cycle.[1] Even when a server is nearing capacity, IBM guarantees system performance at a sustained 80% use level for IBM Power Systems.

The connection between the operating system and the server platform is key to achieving high performance. Red Hat Enterprise Linux for SAP Solutions for Power, LE includes automatic non-uniform memory access (NUMA) balancing. In addition, Red Hat's platform includes SAP-specific tuning profiles to help users maximize performance of their SAP systems.

1 *"Harnessing the Potential of SAP HANA with IBM Power Systems," IBM and SAP, 2016,* https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=POM03015GBEN.

INCREASE SERVER DENSITY AND CAPACITY

Increasing the density of your SAP HANA deployment maximizes your investment and reduces management time and costs. SAP supports the virtualization of up to eight production SAP HANA workloads on a single IBM Power Systems server using IBM PowerVM. IBM PowerVM can also be used to scale a virtualized SAP HANA workload deployed on IBM Power Systems up to 16TB. In addition, running SAP HANA workloads on Red Hat Enterprise Linux for SAP Solutions for Power, LE further increases consolidation to help you maximize your SAP and IBM investments.

IBM Power Systems uses an on-demand capacity model to let customers easily add SAP HANA cores and memory without requiring configuration recertification by SAP. As a result, organizations experiencing growing demand for SAP HANA resources can add them faster.

RUN MIXED WORKLOADS

To further take advantage of server capacity, enterprise IT teams can use a shared pool on IBM Power Systems to run nonproduction workloads, including other Linux workloads. Red Hat Enterprise Linux for SAP Solutions for Power, LE supports running all of these workloads—as well as additional, non-SAP workloads—within a single operating system environment.

As a result, SAP HANA workloads, other SAP workloads—such as those supporting SAP business applications, development and testing, and quality assurance—and third-party application workloads can be run side-by-side on a unified, consistent software foundation. In addition, memory-intensive workloads can be run alongside workloads that are input/output (I/O)-intensive—all on a single platform.

This support for mixed workloads provides maximum flexibility. Resources can be allocated and reallocated to support short- and long-term demand, as well as shifts in demand. For example, running mixed workloads also helps SAP users transition to SAP S/4HANA by supporting necessary conversions. Red Hat Enterprise Linux for SAP Solutions for Power, LE offers a consistent experience and platform to help organizations migrate to SAP S/4HANA at their own pace.

DEPLOY IN ON-PREMISE, CLOUD, OR HYBRID ENVIRONMENTS

SAP customers running Red Hat Enterprise Linux for SAP Solutions for Power, LE experience the same architecture regardless of deployment environment—whether on-premise, in the cloud, or using a hybrid approach.

Logical partitions (LPARs) support a multisystem environment to ensure workloads are isolated when running on a single server. This capability helps managed service providers (MSPs) support their customers, while many other organizations can use this multitenancy feature to support multiple divisions, regions, or business units.

IMPROVE RELIABILITY AND AVAILABILITY

Organizations use SAP HANA for critical applications that cannot experience downtime. Red Hat Enterprise Linux running on IBM Power Systems—hardware designed to mitigate risk—offers the highest availability among major server and operating system platforms.[2]

IBM PowerVM running on Red Hat Enterprise Linux for SAP Solutions for Power, LE supports seamless system transfer of SAP HANA workloads using live partition mobility. With this capability, processor state, memory, attached virtual devices, and connected users can be transferred as needed without disruption.

2 *ITIC, "ITIC 2015-2016 Global Server Hardware, Server OS Reliability Report." IBM.* http://www-01.ibm.com/common/ssi/cgi-bin/ssialias?subtype=WH&infotype=SA&htmlfid=ZSL03380USEN&attachment=ZSL03380USEN.PDF.

In addition, built-in resiliency and full application binary interface (ABI) compatibility lets SAP HANA run any software that runs on Red Hat Enterprise Linux seamlessly on IBM Power Systems and IBM PowerVM.

ENHANCE MEMORY PERFORMANCE

The integrated Red Hat and IBM solution also provides memory resiliency for greater reliability. SAP HANA relies on in-memory processing, with extreme demands on memory management, I/O, and other system resources. IBM Power Systems are engineered by default so that even if up to three memory chips fail, data held in memory will not be corrupted.

In addition, the large memory footprint of IBM Power Systems supports faster execution of SAP HANA in-memory workloads. A single scale-up IBM Power Systems server can support up to 32TB of memory. Higher memory bandwidth provides fast data access to the central processing unit (CPU). Large processor caches keep data close to the CPU, where it is needed for better performance.

Red Hat Enterprise Linux for SAP Solutions for Power, LE offers efficient and balanced memory management algorithms, making it an ideal operating system for memory-intensive applications. Its in-memory processing capabilities let it act as an intermediary between hardware and applications—a critical necessity for in-memory platforms like SAP HANA. For example, when hardware indicates that a sector is no longer available, a virtual map of memory is dynamically updated by the operating system. Processes are moved out of faulty memory and placed into working memory, offering a seamless application experience.

INCREASE STAFF AND COST EFFICIENCY

Red Hat Enterprise Linux for SAP Solutions for Power, LE can be deployed using the SAP HANA tailored datacenter integration (TDI) approach. This approach supports reuse of IT resources—such as server, storage, and networking assets—to offer more technology options than the preconfigured hardware appliances for SAP HANA. IT teams can reuse familiar components, reducing deployment and management time.

According to IDC, organizations that standardize on Red Hat Enterprise Linux for SAP Solutions have more efficient IT staffs.[3] Deployed on IBM PowerVM, this platform helps administrators manage more servers, deploy projects faster, and respond to changing business needs quickly.

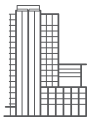
Running SAP HANA workloads on Red Hat Enterprise Linux for SAP Solutions for Power, LE can also reduce management costs by improving consolidation and cutting overhead expenses. By consolidating SAP HANA workloads onto fewer physical systems and creating virtual footprints as failover targets, users can scale up production systems as needed. This approach offers greater efficiency than running idle spare nodes on traditional, scale-out architectures.

By increasing agility and staff productivity across multiple SAP HANA systems, Red Hat Enterprise Linux for SAP Solutions for Power, LE helps organizations free resources for strategic projects.

ACCESS EXPERT, MULTIVENDOR SUPPORT

To support these enterprise deployments, Red Hat, IBM, and SAP offer customers joint support. The companies work closely to identify and resolve issues with a single call from the customer.

3 *"The Value of Standardizing on Red Hat Infrastructure Solutions." IDC. 2016.* https://www.redhat.com/en/resources/value-of-standardizing-red-hat-infrastructure-solutions.



ABOUT RED HAT

Red Hat is the world's leading provider of open source software solutions, using a community-powered approach to provide reliable and high-performing cloud, Linux, middleware, storage, and virtualization technologies. Red Hat also offers award-winning support, training, and consulting services. As a connective hub in a global network of enterprises, partners, and open source communities, Red Hat helps create relevant, innovative technologies that liberate resources for growth and prepare customers for the future of IT.

NORTH AMERICA
1 888 REDHAT1

EUROPE, MIDDLE EAST, AND AFRICA
00800 7334 2835
europe@redhat.com

ASIA PACIFIC
+65 6490 4200
apac@redhat.com

LATIN AMERICA
+54 11 4329 7300
info-latam@redhat.com

facebook.com/redhatinc
@redhatnews
linkedin.com/company/red-hat

With Red Hat Enterprise Linux for SAP Solutions for Power, LE, Red Hat also provides optimizations for SAP HANA running on IBM Power Systems, integration with Red Hat Satellite, and proactive issue identification and remediation via Red Hat Insights.

CONCLUSION

Running SAP HANA on Red Hat Enterprise Linux for SAP Solutions for Power, LE offers a powerful, consistent platform for enterprises to run all of their applications and take advantage of both scale-up and scale-out configurations on a single server. Together, this solution—based on leading enterprise software and hardware—offers resilience for critical workloads and flexibility to help organizations make the most of their infrastructure investments.

Learn more at redhat.com/sap.

ABOUT IBM POWER SYSTEMS

IBM Power Systems are servers designed for mission-critical applications and emerging Cognitive Era workloads, including artificial intelligence, machine learning, deep learning, advanced analytics, and high-performance computing. Designed to deliver efficiency whether deployed in a private, public, or hybrid cloud, Power Systems benefit from a wide range of open technologies, many stemming from collaboration with fellow OpenPOWER Foundation members.

ABOUT SAP

As market leader in enterprise application software, SAP (NYSE: SAP) helps companies of all sizes and industries run better. From back office to boardroom, warehouse to storefront, desktop to mobile device, SAP empowers people and organizations to work together more efficiently and use business insight more effectively to stay ahead of the competition. SAP applications and services enable more than 365,000 business and public sector customers to operate profitably, adapt continuously, and grow sustainably.

For more information, visit www.sap.com.