# Say Goodbye to Downtime

Keep your SAP services up and running with SUSE

**At a Glance:**

Digital transformation initiatives put pressure on your IT organization to adapt to requirements for delivering innovative new services that are reliable and secure. As a result, you are under constant pressure to provide continual uptime in the data center to meet growing customer demand and stay competitive.

**Products**

+ SUSE Linux Enterprise Server for SAP Applications
+ SUSE Linux Enterprise Live Patching
+ SUSE Manager

## Uptime Matters

Your organization depends on your SAP S/4HANA systems for a consistent, 360-degree view of customer buying habits, expectations and sentiment; you turn this data into actionable insight along the supply chain to the customer point of service.

But unplanned outages and manual failover processes are disruptive, labor-intensive, time-consuming and costly. They can shut down production lines, abort transactions or even bring your core business to a standstill, impacting your productivity, revenues and reputation, while increasing costs and putting more pressure on the IT staff, which restricts your ability to deliver innovative services and solutions.

In order to optimize productivity and revenues while enabling innovation you need an infrastructure that helps you achieve near-100% uptime of your SAP HANA systems.

## Solutions for Sustained Uptime

SUSE solutions for SAP systems enable customers to nearly eliminate planned and unplanned downtime:

- SUSE Linux Enterprise Server for SAP Applications
- SUSE Linux Enterprise Live Patching
- SUSE Manager

## Automating SAP HANA System Replication

Modern SAP systems running critical workloads need to meet the highest standards for availability for their SAP services. Achieving the ideal goal of zero downtime may be a physical impossibility for some organizations. Business continuity architectures based solely on SAP HANA System Replication rely on the

> "The High Availability Extension in SUSE Linux Enterprise for SAP Applications is phenomenal. The failover is completely automatic, it only takes a few seconds, and it has already helped us avoid several long outages."
>
> **Chris Nega**
> Manager, Systems Engineering
> Day & Zimmerman

system administrator to determine that a failure has occurred and initiate the failover to the secondary system.

**SUSE Linux Enterprise Server for SAP Applications** enhances this feature by providing resource agents for detecting a failure and automating the SAP HANA takeover. SUSE has implemented the automation with the help of two resource agents: the SAPHanaSR resource agent, which performs the actual check of the SAP HANA database instances, and the SAPHanaTopology resource agent, which runs information about the status and configuration of system replications.

While SAP is adding support for additional SAP HANA System Replication scenarios based on company requests, SUSE matches those by adding failover detection and automation for those scenarios as well. SUSE Linux Enterprise Server for SAP Applications currently supports following failover automation for the SAP HANA System Replication scenarios:

- Performance-optimized scale up
- Cost-optimized scale up
- Chain topology scale up
- Performance-optimized scale out

## USING PERSISTENT MEMORY TO REDUCE DOWNTIME

Another way to reduce downtime of SAP HANA systems is by using persistent memory. SAP has validated the use of two approaches to persistent memory for SAP HANA databases to enable instant database recovery after system reboots.

One approach for x86-64 systems is to use the Intel Optane® NVDIMM (Non-Volatile Dual Inline Memory Module) technology that has been validated by SAP to reduce the wait time to reload data because the SAP HANA database retains the columnar data during the shutdown.

For IBM Power Systems with IBM PowerVMtm there is the Virtual PHEM solution that's been validated by SAP to reduce recovery time because the SAP HANA database retains the SAP HANA data in a part of the server that is still running during the shutdown of the LPAR that HANA is running in. When the LPAR is restarted, the data is immediately transferred from DRAM to DRAM.

Both solutions eliminate the need to wait for data to load into traditional RAM from storage, which can take several hours for large SAP HANA databases.

### Multiple Kernel Fixes Without Interruption

When critical Linux updates, for security or data integrity, are released for the operating system, a reboot is usually necessary for those changes to take effect — a reboot that in most cases affects the service availability.

If you struggle with the balance of service security versus availability, **SUSE Linux Enterprise Live Patching** is the answer. It allows you to apply multiple SUSE Linux Enterprise Server kernel fixes on the fly — without interruption, without reboot for up to a year, without downtime. And the best is, you can use it independently from the application that runs on

> "SUSE were the first to bring Linux live patching to IBM Power Systems. We have tested it with the goal of maximizing availability further and improving business continuity, and we're planning to start using this brand new, cutting-edge feature in production. It will allow us to apply patches to the Linux kernel without rebooting our systems and keep our applications running smoothly to get even closer to zero-downtime deployments."

**Volker Fischer**
Senior Manager Server Services
Bosch Group

top. This can be an SAP application server, an SAP database, or even SAP HANA. The benefits include increased service availability and reduced planned or unplanned downtime.

More information on the support status as well as setup instructions for SAP applications are available through SAP Note 1984787 . So, instead of waiting for the next maintenance window, just apply the patch when it is released to secure your system.

**Automated System Management**

Numerous studies have shown that IT infrastructure that is stable and reliable in the long term determines a company's economic success. This applies particularly to a platform such as SAP HANA, which can boost performance significantly for both SAP and non-SAP applications.

However, for interaction to work smoothly it requires a system management solution that is not only easy-to-use but that also offers refined and extensive functions. In this respect, **SUSE Manager** is the tool of choice because it combines methods, processes and functions to manage, monitor and control complete SAP HANA scale-out scenarios.

At the heart of the tool is automatic patch and update management, which integrates all relevant operating system components in an SAP HANA environment.

The benefits of using SUSE Manager include:

- Minimized complexity of SAP HANA environments — because both system management and updates come from a central location.
- Precise control of the environments needed for enterprise operations — whether development, test or production systems.
- Simplification of compliance requirement implementation — for instance, to meet internal policies and regulatory requirements.
- Reduced costs — it reduces the manual and recurring tasks required for platform management.

**Learn more about keeping your SAP services up and running with SUSE.**