



Whitepaper:
Back Up SAP HANA™
& SUSE Linux Enterprise
Server with SEP

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Introduction and Overview

SUSE Linux Enterprise Server for SAP Applications with SEP

SUSE, SAP and SEP are committed to providing all of the functionality, performance and interoperability required to support today's complex environments. Together, they offer world-class solutions to protect and take full advantage of users' investments in their IT infrastructure. SUSE, SAP and SEP have formed a partnership using their industry-leading technologies to provide a complete data protection solution for the SAP HANA environment.

SUSE Linux Enterprise Server (SLES) is the recommended and supported O/S for SAP HANA. SEP is a SAP certified backup and disaster recovery solution to protect SAP HANA. This whitepaper describes the benefits of using SEP for the backup of SAP HANA on a SUSE Linux Enterprise Server.



Solution Components

SAP HANA

The SAP HANA in-memory database is the perfect solution to combine database, data processing, and application platform capabilities in one. It takes full advantage of the latest hardware technologies by combining data storage, massively parallel processing (MPP), and utilizing memory to optimize database performance. SAP HANA's advanced software design provides libraries for predictive planning, text processing, and both spatial and business analytics. Regardless of the industry, SAP HANA can provide high-speed, real-time insights into any business.

The SAP HANA database holds its data in-memory to maximize performance and utilizes storage capabilities to provide a fallback in the event of an error. After a failure, for example, the database can be restarted like any conventional disk-based database and work can resume.

SUSE Linux Enterprise Server for SAP Applications

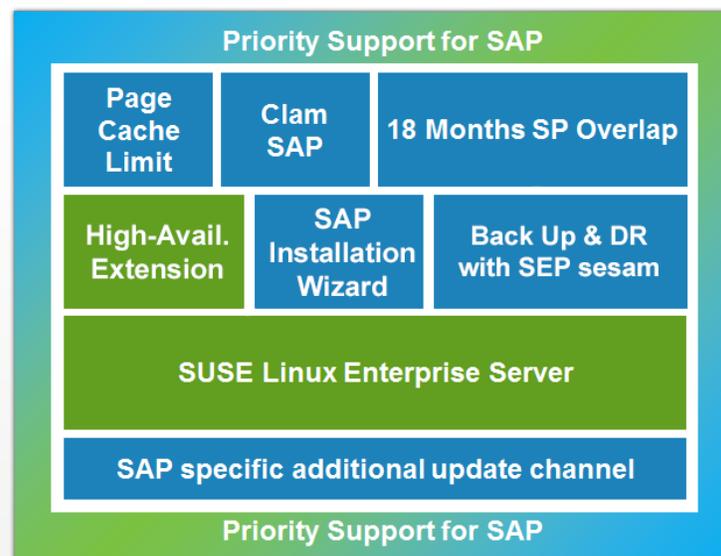
SUSE Linux Enterprise Server is a secure and reliable open-source operating system proven to reduce costs, increase availability, and improve system performance. It is the only operating system optimized for all mission-critical SAP software solutions and appliances.

SAP relies on the Linux platform to optimize its in-memory technology and engaged SUSE as a development and innovation partner to collaborate in the creation of the SUSE Linux Enterprise Server for SAP Applications.

SEP Backup and Disaster Recovery

SEP is a SAP certified and SUSE Linux Enterprise Server certified backup solution that integrates seamlessly into any IT environment. SEP offers comprehensive, cost-effective, scalable and reliable backup and recovery solutions for SAP HANA.

SUSE Linux Enterprise Server for SAP Applications is a high-performance operating system platform powered by enterprise services that addresses the specific needs of SAP customers. The package can include the following:



Software Components

- SUSE Linux Enterprise Server
- SUSE Linux Enterprise High-Availability Extension
- An installation wizard for automated extendable installation workflow provides seamless integration of the SAP application, operating system installation and additional customer or partner tools/workflows, such as SEP
- Support for large workloads to optimize paging behavior of Linux for large, memory-intensive applications
- ClamSAP as cost efficient cross-platform thread protection with help of ClamAV and the SAP NetWeaver Virus Scanning API

Services

- Extended service pack support to allow customers to run the next to last service pack for 18 months
- SUSE Linux Enterprise Priority Support provides 24x7 support from SAP and SUSE through the SAP Ticket System

SAP HANA: Data Protection

SAP HANA is an in-memory database – all data processing is done within the main memory. To help prevent data loss, SAP HANA writes regular save points using persistent storage volumes for log information and data.

With save points and log writing, SAP HANA can fully recover systems from power failures. However, it cannot prevent data corruption through damage to storage media or logical error.

SEP offers comprehensive data protection of any SAP HANA environment. This includes backups to protect the database against data corruption or data deletion and replication for disaster recovery.

SEP backups are necessary to:

- Ensure against disk or other media failure
- Reset the database to an earlier point in time
- Prevent data loss from logical errors
- Provide protection beyond replication

Backups are critical when copying a database and securing a fallback after a failed installation of updates. SEP backups can be performed while the database is online. SAP HANA controls the backup with the help of SAP HANA Studio, where two destination options are available:

- **File:** backs up the database to files in the file system
- **BACKINT:** backs up the database using SEP

The SAP BACKINT interface ensures that all activities are easily defined and managed.

SEP Backup & Disaster Recovery

SEP is a robust, easy-to-manage, and secure backup solution for businesses of any size. Backups, restores, and disaster recovery are easy to implement and quickly execute for all SAP HANA environments. SEP is certified for SUSE Linux Enterprise Server, SAP HANA on Intel and IBM Power platforms, SAP NetWeaver, SAP ASE, SAP installations using Oracle and MaxDB, and SAP Business One.

The solution supports all common operating systems, virtual hypervisors, applications, databases and storage technologies (NAS, SAN, tape libraries, etc.). The SEP backup solution eliminates the need for multiple backup products in a single environment.

Patented Multi-Streaming Technology allows multiple streams to be backed up and restored simultaneously, drastically reducing backup windows. SEP is designed to simplify and automate backups in any environment – physical, virtual and cloud.

SAP HANA

Backups can be initiated using SAP HANA Studio, the DBA Cockpit in BW, SQL script commands, or third-party tools, which are not automatically run by the SAP HANA system. The most efficient way to schedule backups is to use the SEP scheduler or the SAP HANA administration tool within the SAP HANA Studio.

SEP backs up SAP HANA utilizing the SAP BACKINT API. No additional software agents are needed.

Communicating with the SAP HANA database through the SAP BACKINT API, SEP backs up the database and writes the backup data directly to external storage.

Features and Functionality

Functionality	SAP HANA (Backint)	Compatible with SEP
Data and Log Backup	Yes	Yes
Backup Scheduling	Not available in SAP HANA Studio. External schedulers can be used in conjunction with scripts (SQL interface)	Yes, SEP can initiate SAP HANA backups
Manual Backups	Yes, SAP HANA Studio, SQL commands (hbdsq), external scheduler triggering	Yes, SAP HANA Studio, SQL commands (hbdsq), external scheduler triggering
Backup of Configuration Files	No	Yes
Point-in-Time Recovery	Yes	Yes
Recovery to a Specified Location	Yes	Yes
Backup Media and Capacity Management	No	Yes
Data Encryption	No	Yes
Multi-Copy and Retention Management	No	Yes

SAP HANA - Backing Up to Disk

When implementing new technologies, it is important to consider the entire data storage and recovery plan.

SAP HANA administrators must manage all aspects of the data backup and disaster recovery. These tasks include ensuring the availability of the backup storage, proper storage management, allocating adequate backup space, cleaning old backups, optimizing performance, maintaining firewall settings, and tracking retention times and data migration.

A backup and recovery plan is a critical component of business continuity and requires planning and design to ensure recovery time objectives (RTOs) are fulfilled.

Backing Up Using BACKINT with SEP

Once SEP has been configured for a SAP HANA environment, backups can be initiated from either the SAP HANA Studio console or the SEP backup server. The SAP HANA Studio monitors the details of the individual backup jobs in real-time while SEP processes the SAP BRTOOLS requests, which are transferred via the BACKINT API.

SEP BACKINT support provides an easy method to manage and protect SAP data. SEP defines the parameters for the backup jobs and how they will be executed – including all details regarding the backup clients, backup media information, and the backup schedule.

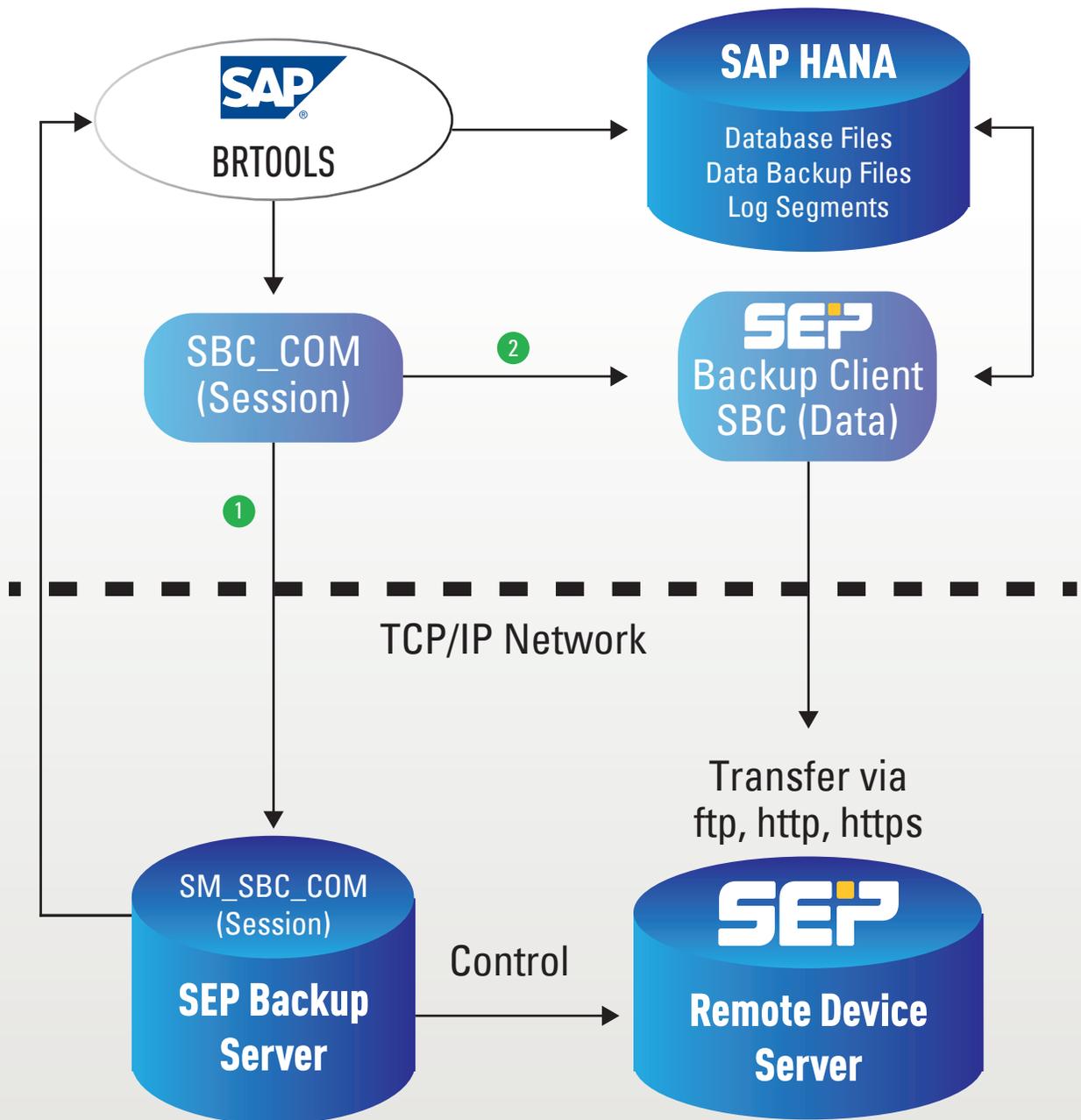
SEP's advanced data store technology allows the use of any available backup media to ensure that all backup jobs will be successfully completed. The powerful SEP restore wizard can be set up to automatically recover data as needed.

Data is directly transferred to and from the SEP backup media, removing any intermediate step of restoring data to an additional backup medium. Backup results are stored in the SEP media catalog to easily view save-sets and provide a fast recovery at any time if needed.

SEP monitors the statuses of SAP HANA backup and recovery tasks. All backup and recovery issues can be monitored and controlled by the SEP management interface. SEP offers an extensive list of commands to implement the most user-friendly and flexible backup topology possible.

SAP HANA Backup Implementation

SEP backup server is installed with SAP HANA on separate SUSE Linux Enterprise Servers



Restore Using SAP HANA Studio

There are three ways to restore data using SAP HANA Studio:

1. **Restore the database to the latest version.** Restores the last successful backup of the database.
2. **Restore the database to a prior timestamp.** Restores the last successful backup of the database before a desired timestamp. This option is extremely valuable when a database has been corrupted or portions have been deleted by user error.
3. **Restore the database to a specific data backup.** Provides the user a list of available database backups and the user can restore any of the backups listed.

In a recovery, SAP HANA shuts down the database and recovers the data and log files in one recovery operation. The SAP HANA Studio offers various options to explore specific backup details, such as statistics, files sizes, and data throughput during backup tasks. The backup history can be retrieved from either the local SAP HANA backup catalog or from the SEP backup server – in case SAP HANA backup catalog is lost. The inquiry is done via the BACKINT API. In addition to the SAP HANA Studio, the SAP BRTOOLS allow users to explore the backup history and to recover databases with SEP.

Deduplication

SEP Si3 Deduplication technology organizes the incoming data into blocks for analysis. An algorithm generates hash values that clearly identify the values in the deduplication store, which are then stored in an index. As subsequent backups are completed, new values are saved. When the data has a hash value that is already indexed, the data will not be stored a second time and the hash count will increase with each backup. Unique data always generates a new hash code. Deduplication must always take place before compression and encryption. The advantage of SEP Si3 Deduplication for SAP HANA is the ability to optimize storage consumption.

Conclusion

SEP provides a SAP Certified backup solution for mission-critical SAP HANA applications running on SUSE Linux Enterprise Server. SEP delivers a solution that excels in reliability and performance while minimizing costs, which makes SEP one of the most recommended backup and disaster recovery solutions on the market today. With SEP for SUSE Linux Enterprise Server and SAP Applications, users receive an unparalleled backup and recovery solution for their environments.

Want a personalized demonstration? SEP engineers can help users develop a world-class backup strategy by creating a test environment scaled to match the real-world application of the solution. Visit www.sepusa.com or email us at info@sepusa.com to request a proof of concept and find out more about our solution.