

SEP Hybrid Backup & Disaster Recovery



Back Up SAP HANA and SUSE Linux Enterprise Server with SEP sesam



SAP[®] Certified
Integration with SAP HANA[®]

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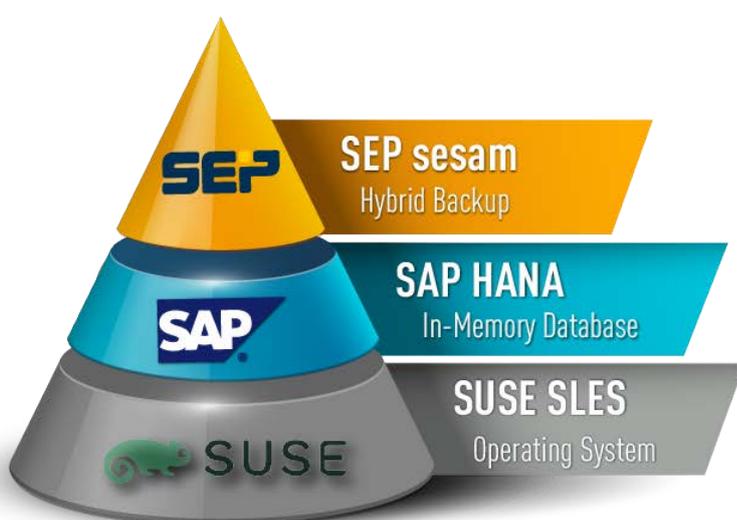
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1. Introduction and Overview

SUSE Linux Enterprise Server for SAP Applications with SEP sesam

SUSE, SAP and SEP are committed to meet customer needs providing all the functionality, performance and interoperability required to meet today's demanding customer environments. Together, they offer world-class solutions at an optimal price to implement, protect, and improve customers' investments in their IT infrastructure. SUSE, SAP and SEP have now formed a partnership using their industry-leading IT infrastructure and application technologies to provide a complete data protection solution for the SAP HANA Version 1+2 on Intel- & IBM Power platforms.

SUSE Linux Enterprise Server (SLES) is the recommended and supported O/S for SAP HANA. SEP sesam is a SAP certified backup and disaster recovery solution to protect SAP HANA 1 & 2 on Intel- & IBM Power platforms, SAP NetWeaver & SAP ASE. This whitepaper describes the benefits of using SEP sesam for the backup of SAP HANA on a SUSE Linux Enterprise Server.



2. Solution Components

2.1. 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 your 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 power failure, for example, the database can be restarted like any conventional disk-based database and work can resume.

2.2. 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.

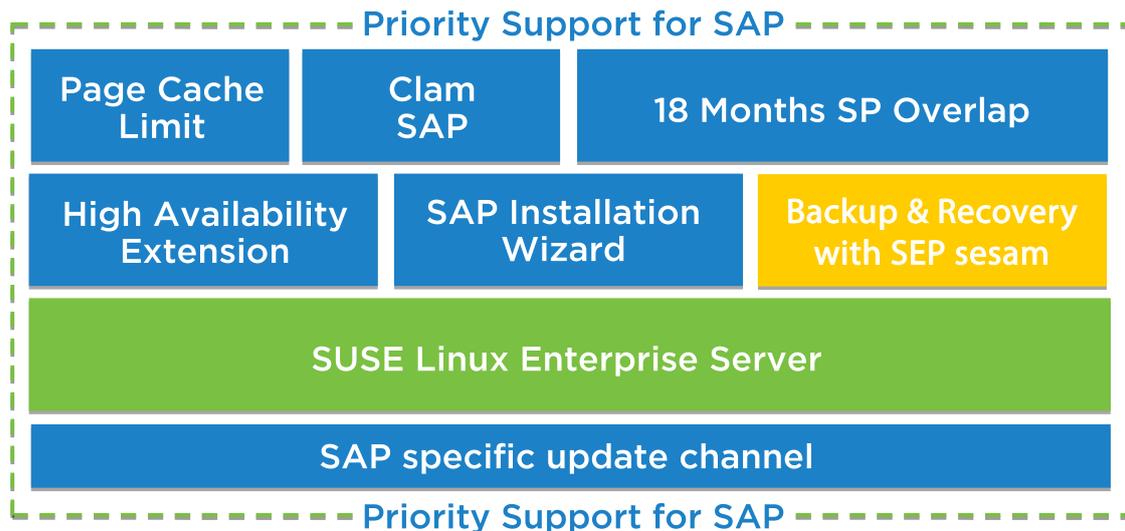
SAP relies on the widely-used Linux platform to optimize its in-memory technology, and engaged SUSE as a development and

innovation partner to collaborate in the creation of SUSE Linux Enterprise Server for SAP Applications.

2.3. SEP sesam Backup and Disaster Recovery

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

SUSE Linux Enterprise Server for SAP Applications is an enhanced 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, providing seamless integration of the SAP application, operating system installation and additional customer or partner tools/workflows such as SEP sesam
- 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 instead of 6 months
- SUSE Linux Enterprise Priority Support provides 24x7 support from SAP and SUSE seamlessly through SAP Ticket System

3. SAP HANA: Data Protection

SAP HANA is an in-memory database, i.e., 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, but it cannot prevent data corruption through damage to storage media or logical error.

SEP provides comprehensive data protection of SAP HANA environments with its backup product, SEP sesam. This includes backups to protect the database against data corruption or data deletion and replication for disaster recovery purposes.

SEP sesam backups are necessary to:

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

Backups are also extremely useful in scenarios when copying a database or securing a fallback after a failed installation of updates. These backups can also 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 sesam
- Hardware Storage Snapshots

The SAP BACKINT interface makes certain that all activities are defined and managed.

4. SEP sesam Backup and Disaster Recovery

SEP sesam is a robust, easy-to-manage, and secure backup solution for businesses of any size. Backups, restores, and disaster recovery are extremely fast and easy to implement and execute for all SAP HANA environments. SEP sesam is certified for SUSE Linux Enterprise Server, SAP HANA on Intel- & IBM Power platforms, SAP NetWeaver, traditional SAP installations using Oracle or MaxDB, as well as other popular databases that run on Linux or Windows.

The solution supports all common operating systems, virtualization platforms, applications, databases and storage technologies (NAS, SAN, tape libraries, etc.). The SEP sesam Hybrid Backup solution eliminates the need for multiple backup products within company infrastructures.

SEP's patented Multi-Streaming Technology allows multiple streams to be backed up simultaneously and entire company infrastructures easily managed by a single interface. This enterprise-wide solution is designed to simplify and automate backups in any environment.

SEP sesam for SAP HANA - Backup and Recovery

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 sesam scheduler or the SAP HANA administration tool within SAP HANA Studio.

SEP sesam backs up SAP HANA utilizing the SAP BACKINT API and no additional software agents are needed.

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

5. Features and Functionality

Functionality	SAP HANA (Backint)	Compatible with SEP sesam
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 sesam polices can be configured to initiate SAP HANA backups
Manual Backups	YES. SAP HANA Studio, SQL commands (hbdsq), external scheduler triggering	Yes, SAP HANA Studio, SQL commands (hbdsq), SEP sesam Command Events
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

6. SAP HANA - Backing Up To Disk

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

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 enough backup space, cleaning out old backups, optimizing performance, maintaining firewall settings, and keeping track of retention times and data migration.

Backup and recovery is a multi-level process, requiring sufficient planning and design to ensure recovery time objectives (RTOs) are fulfilled.

7. Backing Up Using BACKINT with SEP sesam

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

SEP sesam BACKINT support provides an easy method to manage and protect SAP data. SEP sesam 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.

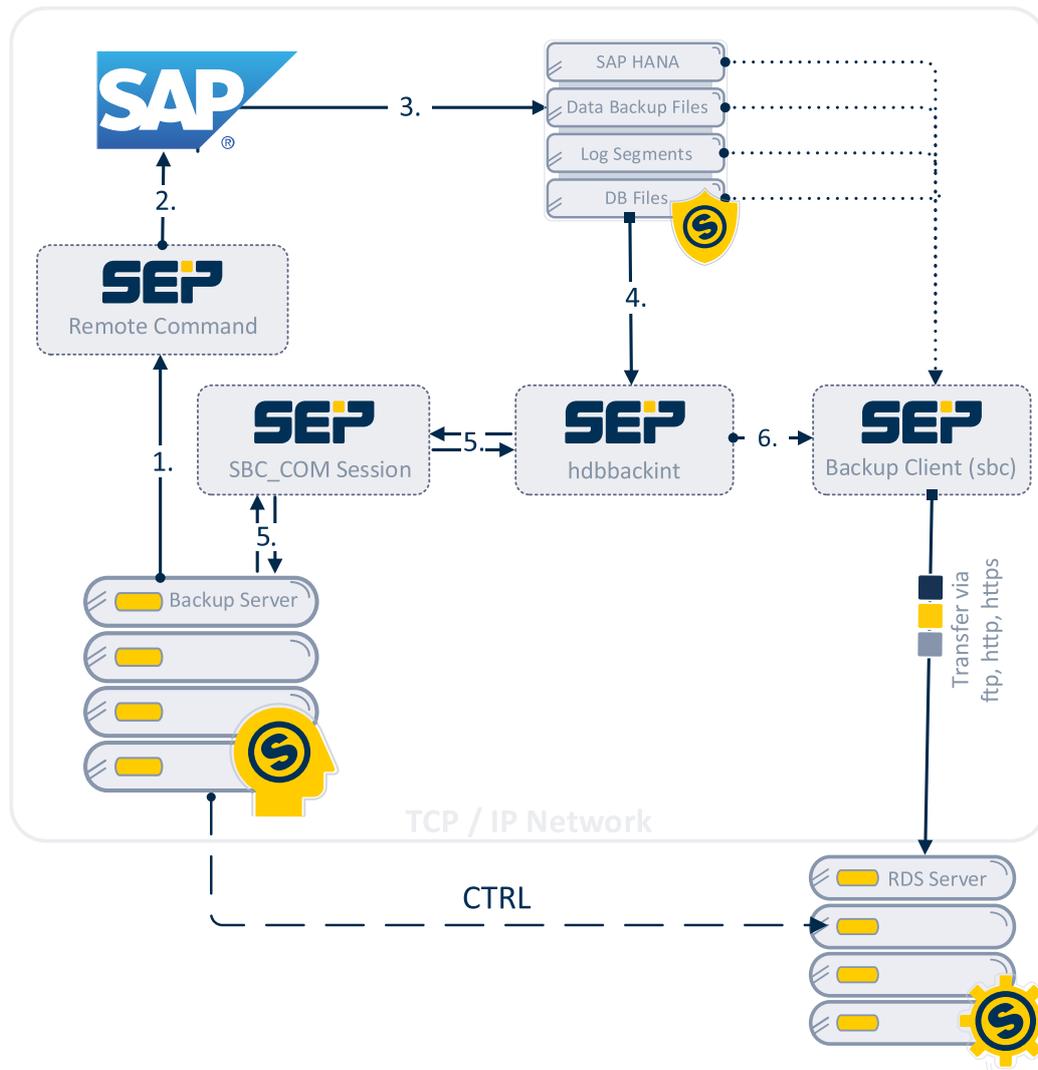
Using SEP sesam's patented Multi-Streaming Technology, backup tasks can be run simultaneously, thus significantly decreasing backup windows. SEP sesam's advanced data store technology allows the use of any available backup media to ensure that all backup jobs will be performed. The powerful SEP sesam restore wizard can be set up to automatically recover data as needed.

The data is directly transferred to and from the SEP sesam backup media, removing the intermediate step of restoring data to an additional backup medium. Backup results are stored in the SEP media catalog to allow an efficient inquiry of existing save-sets and a high-performance recovery.

The status of the SAP HANA backup and recovery tasks are monitored by SEP sesam. Almost all backup and recovery issues can be monitored and controlled by the SEP sesam management interface. In addition, SEP sesam offers an extensive list of commands to implement the most complete and user modifiable backup topology possible.

SAP HANA Backup Implementation

SEP sesam backup server is installed with SAP HANA on SUSE Linux Enterprise Server.



The SEP sesam SAP HANA implementation works like this:

1. / 2. SEP sesam backup server starts a remotecommand on the database server.
3. SAP HANA hdbsql is executed to execute the backup query of the SAP HANA database.
4. / 5. The SAP HANA database prepares the backup savepoint and sends the metadata to the SEP sesam backup server
6. The SEP sesam Backup Client (SBC) process started to transfer the backup data to the SEP sesam Server or Remote Device Server (RDS)

8. Restore Using SAP HANA Studio

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

1. Restore the database to the latest version. This option restores the last successful backup of the database and applies all available logs.
2. Restore the database to a specific Point-In-Time. This option restores the last successful backup of the database and all logs until the specified Point-In-Time. This option is extremely valuable when a database has been corrupted or portions deleted by user error.
3. Restore the database to a specific data backup. This option provides the user a list of available database backups. The user or system administrator may restore any of the available backups.

In a recovery, SAP HANA shuts down the database and recovers the data and log files in one recovery operation. 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 sesam backup server, e.g. in case of a lost SAP HANA backup catalog. The inquiry is done via the BACKINT API.

9. SEP sesam Si3 Deduplication

SEP's Si3 Inline Deduplication Technology organizes the incoming data into fragments or 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. The advantage of SEP's Si3 Inline Deduplication for SAP HANA is the ability to optimize storage consumption. Deduplication must always take place before compression and encryption.

10. Conclusion

SEP sesam provides a SAP-certified backup solution for mission-critical SAP HANA enterprise applications running on SUSE Linux Enterprise Server. SEP delivers a solution that excels in reliability and performance while minimizing costs which makes SEP sesam one of the most recommended backup and disaster recovery solutions on the market today. With SEP sesam for SUSE Linux Enterprise Server and SAP Applications, customers get the best backup solution for their mission-critical 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 intended real-world application of the solution. To request proof of concept assistance, visit www.sep.de or email us at info@sep.de.

**Headquarters (EMEA):**

SEP AG
Konrad-Zuse-Strasse 5
83607 Holzkirchen, Germany
Phone: +49 8024 46331 0
Fax: +49 8024 46331 666
Email: info@sep.de

SEP USA:

470 Atlantic Avenue, 4th Floor
Boston, MA 02210, USA
Phone: (+1) 617-273-8200
Fax: (+1) 617-273-8001
Email: usa@sepsoftware.com

SEP APAC:

3 Spring Street
Sydney NSW 2000 n, Australia
Phone: +61 2 9659 9590
Fax: +61 430 196 446
Email: apac@sepsoftware.com

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