SEP sesam Hybrid Backup for Red Hat Virtualization

First Data Protection Solution that fully integrates with RHV

SEP sesam Hybrid Backup – First Data Protection Solution that fully integrates with Red Hat Virtualization (RHV)

Native backup API support allows SEP to provide enterprise backup functionality for Red Hat Virtualization users

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1. Introduction and Overview

There are several ways to back up virtual machines (VMs) running on Red Hat Virtualization (RHV). At a high-level, there are three ways to do RHV VM backups:

- Cold Backup
- Agent Based Backup
- API Based Hot Backup

1.1. Cold Backup

Cold backups are supported in RHV through the RHV Manager, which provides export and copy capabilities, as well as through scripting from the command-line interface (CLI).
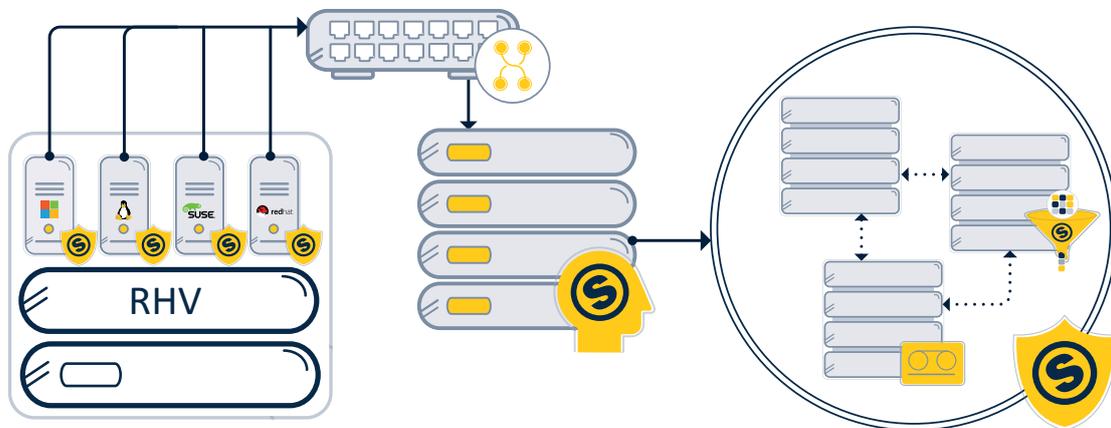
Cons:

- In this scenario, VMs are offline during the backup process
- Monitoring and alerting is not available
- Scheduling, backup migration/tiering, deduplication and replication is not available

1.2. Agent Based Backup

Backing up virtual machines and performing consistent backups during operation of the virtual estate on the Red Hat Virtualization platform has, using solutions available to date, involved tedious amounts of configuration and setup.

This means treating each VM as if it were a physical machine, installing a backup agent on each one, together with any additional agents or components required to back up the VM workload.

Process of Data Backup: The installation of a Backup Client Software Package inside every virtual machine has to be performed.

Cons:

- In case of a Disaster Recovery, the VMs are treated like physical machines. That means the recovery process has to be started with a bare metal disaster recovery solution (e.g. SEP sesam BSR for Windows and Linux)
- All backup and restore data flows over the LAN, meaning this must be equipped to cope with large data transfers on a regular basis

1.3. API Based Hot Backup

The primary focus of this document is API based hot backups, whereby virtual machines can be backed up without incurring downtime.

SEP's backup solution, SEP sesam (version 4.4.3 or later), is a game changer. It features tight integration with the new RHV backup API that was first released as part of Red Hat Enterprise Virtualization 3.5.1. SEP sesam is now capable of performing consistent, agentless backups of all Red Hat Virtualization virtual machines, regardless of their workload or operating system. Leveraging the live snapshot capabilities built into Red Hat Virtualization, consistent backups of virtual machines are assured without any downtime, even if they are in productive mode at the time of backup.

Pros:
- No downtime during backup
- Easy Disaster Recovery of virtual guests
- Optimized performance for virtual machines
- Fast LAN free backup and restore scenarios are possible
- Requires minimum backup storage space due to Si3 Deduplication technology
- Offers advanced backup functionality through SEP's backup solution
- Backups and restores of any guest operating system can be performed

Cons:
- May not consider database and application vendors' instructions
- In the next section, we discuss the implementation of this approach with SEP's backup solution, SEP sesam

2. Enhanced Backup Enablement with SEP sesam

This section describes how to use RHV's backup enablement features with SEP sesam. This includes an overview on how the different components work with each other together as well as specific setup instructions for SEP sesam and RHV. This document does not cover any specific SEP sesam installation instructions and general configuration, so a good understanding of the SEP sesam product is a prerequisite.

2.2. Solution Overview

Since SEP sesam communicates directly with the RHV hypervisor, it does not matter what operating system is running as a virtual guest. Windows, Linux, or any other operating system supported by the RHV hypervisor is treated as a virtual guest and backed up directly via communication with the hypervisor.

2.3. Backup Granularity

Backups can be as granular as required – you can back up everything from the configuration or individual disk of a single virtual machine to all virtual machines on an entire Red Hat Virtualization cluster.

2.4. Setting up SEP sesam on Red Hat Virtualization

Required components for this solution are:

- SEP sesam Backup Server
- SEP sesam Remote Device Server (RDS)
- DataMover (SEP sesam Backup Server/RDS can assume this task)
- Backup Storage (backup target)

It's easy to set up SEP sesam with Red Hat Virtualization and you can be up and running and backing up your first Red Hat Virtualization virtual machine in just 10 minutes after installing the SEP sesam backup solution. No agents are required on the Red Hat Virtualization manager, hypervisors, or even the VMs – all you need is a VM within the Red Hat Virtualization environment on which to run SEP sesam and suitable backup storage. The API integration means SEP sesam can lookup and reference all VM names on the RHV server, making configuration straightforward.
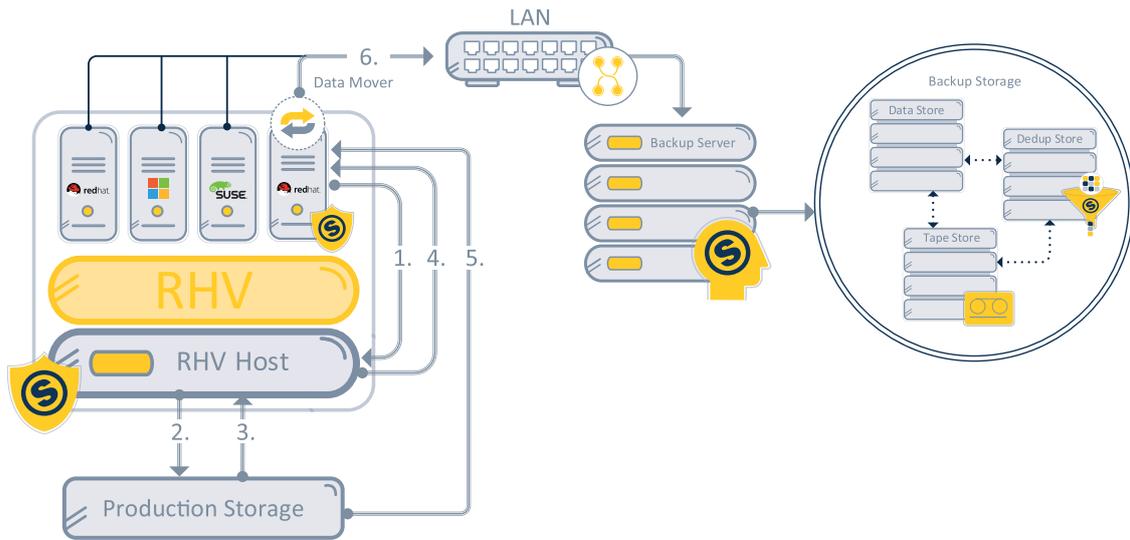
2.5. Backup and Recovery Scenarios

SEP sesam's Red Hat Virtualization backup can operate in two modes – LAN based backup and LAN free backup - so you will need to decide which is best for your situation and objectives. We will now explore these options.

2.5.1. LAN Based Backup

The first scenario assumes that the SEP sesam server is external to the Red Hat Virtualization environment, and that the backup storage is attached directly to this server - this can be any kind of storage, like disk or tape, that the backup server hardware supports such as SATA, SCSI, FC or other SAN/NAS based storage.

When the SEP sesam server is external to the Red Hat Virtualization environment a single VM must be used within the Red Hat Virtualization datacenter that is dedicated to the SEP sesam backup environment – this consists of an install of the SEP sesam Remote Device Server running on top of Red Hat Enterprise Linux (version 7 or later). This VM is known as the SEP sesam DataMover. Note that it is possible for the SEP sesam server itself to reside within the Red Hat Virtualization environment and that in this case the SEP sesam backup server can also be the DataMover.

The picture below shows this architecture and the basic data flows – as you can see, all backup and restore data flows over the LAN, meaning this must be equipped to cope with large data transfers on a regular basis:

The process of data retrieval includes the following steps:

1. A snapshot of the VM to be backed up is created. This action enables consistent backups to be taken of VMs that are running without interrupting their operation [1.].

2. Once the snapshot is successfully created, the VM configuration is exported from the snapshot and backed up as the first stream in the saveset [2.|3.|4.].

3. The VM disks present in the snapshot are then attached to the DataMover VM using the backup API. Once attached, the data on these disks is backed up and upon success, the snapshot is removed again [5.|6.]

2.5.2. LAN based Recovery
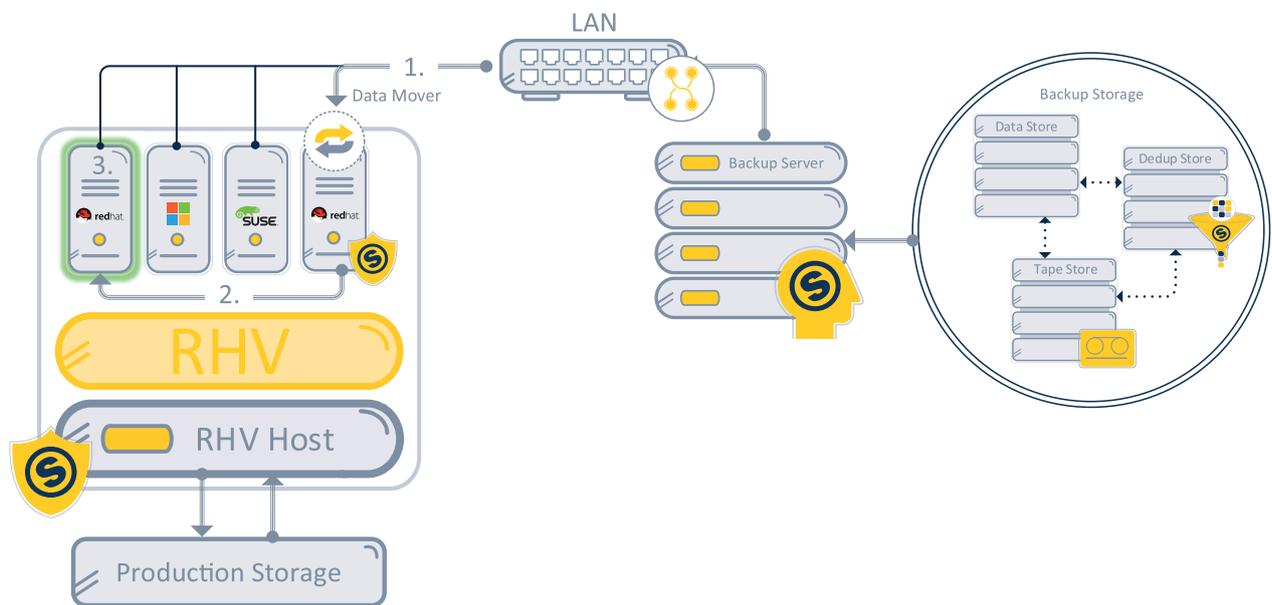
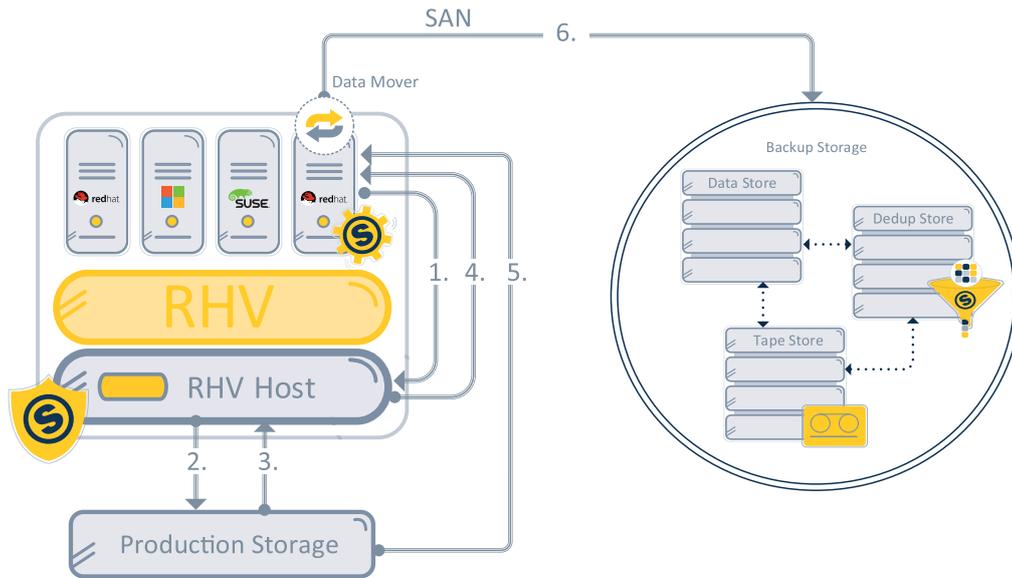**The process of restoration includes the following steps:**

1. The VM configuration is restored to the SEP sesam DataMover VM and then the target VM is created from this.

2. The disks on the target VM are then created and attached to the SEP sesam DataMover VM so that the data can be restored.

3. Once the restore is successful, the disks are then detached and attached to the target VM itself so that it can be used.

2.5.3. LAN Free Backup

The other possible architecture for implementing native Red Hat Virtualization backup on SEP sesam involves using the SAN storage connected directly to the Red Hat Virtualization cluster itself. This has the advantage that, whilst working in a very similar way to the LAN based backup, large volumes of backup data are not traversing the LAN, but are being transferred across your dedicated storage interface.

The storage on the SAN uses the same architecture as a LAN based backup – there is still a DataMover VM within the RHV cluster, and the SEP sesam Backup Server may reside externally, or be combined with the DataMover VM as required. The only difference is that the storage is attached directly to the DataMover VM using the Storage Area network.

The picture below shows the architecture and the basic data flows – as you can see, all backup and restore data flows over the SAN.

The process of data retrieval includes the following steps:

1. A snapshot of the VM to be backed up is created. This action enables consistent backups to be taken of VMs that are running without interrupting their operation [1.].

2. Once the snapshot is successfully created, the VM configuration is exported from the snapshot and backed up as the first stream in the saveset [2.|3.|4.].

3. The VM disks present in the snapshot are then attached to the DataMover VM using the backup API. Once attached, the data on these disks is backed up and upon success, the snapshot is removed again [5.|6.]

2.5.4. LAN Free Recovery
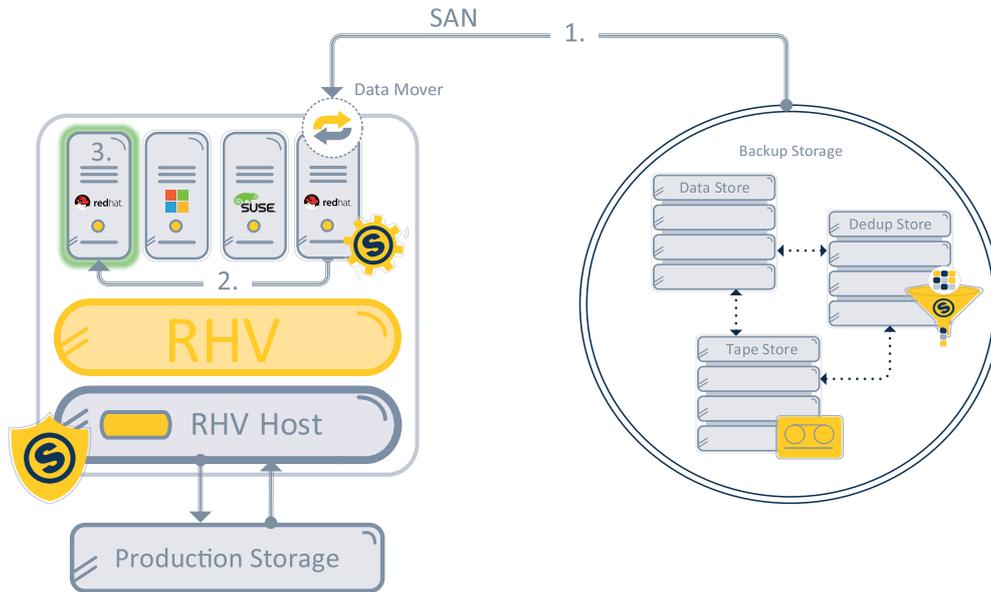
The process of restoration includes the following steps:

1. The VM configuration is restored to the SEP sesam DataMover VM and then the target VM is created from this [1.].

2. The disks on the target VM are then created and attached to the SEP sesam DataMover VM so that the data can be restored [2.].

3. Once the restore is successful, the disks are then detached and attached to the target VM itself so that it can be used [3.].

2.6. RHV Cluster

SEP sesam fully supports backup of all virtual machines in a high availability RHV Cluster environment. The SEP sesam components communicate directly with the RHV host resource pool, so if any backup tasks have failed, they are able to properly follow VMs over to a different RHV cluster host. SEP sesam is able to find any virtual guest anywhere on the cluster and initiate a backup. Based on the backup selection, the guest will be set to the required level for backup and the entire guest virtual machine will be backed up.
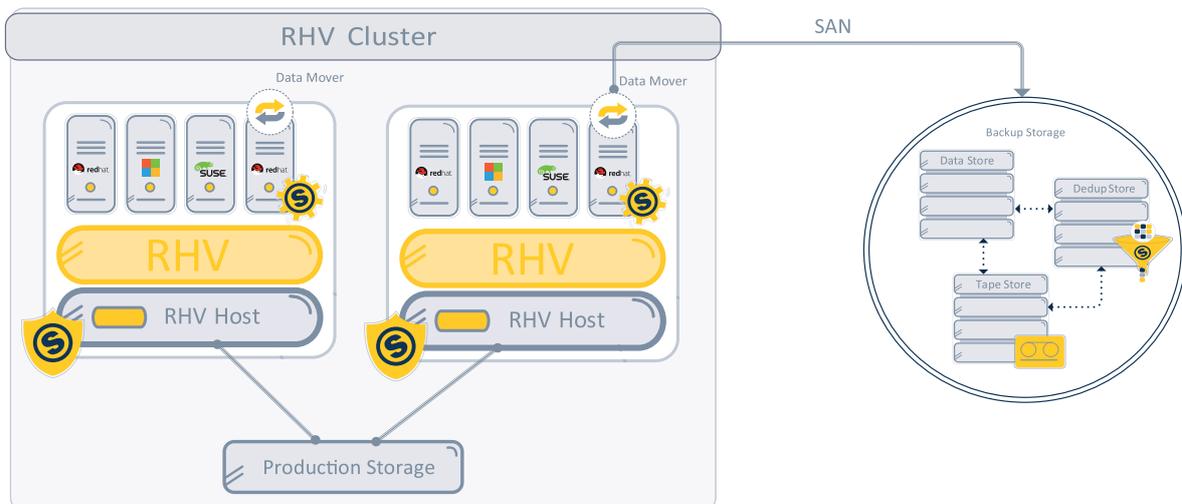
## 2.7. Backup Deduplication and Site-to-Site Replication Scenarios

The SEP sesam backup server stores the backup data in SEP sesam (disk based) DataStores, tapes, VTLs and tape loaders. To significantly reduce the amount of required disk backup storage, SEP offers the Si3 technology.

With SEP sesam, administrators have the ultimate flexibility to use storage hardware (including tape loaders) from practically any desired storage vendor in combination with Si3 Deduplication as a backup target.

Si3 is a hardware independent technology, fully integrated in SEP sesam, that enables highly-efficient, variable, inline, block-level, source and target data deduplication and fast, bandwidth-saving, site-to-site replication. All virtual machines backed up to an Si3 deduplication store are deduplicated. That means that, for example, similar virtual guests are only stored once in the Si3 backup storage. It is an excellent choice for storing multiple VM backups that would otherwise take up vast amounts of storage space. Equally useful is the ability to perform highly-efficient, block-level replication of data to another Si3 Deduplication store, thereby providing an efficient way of replicating data to an unlimited number of DR sites.

SEP sesam replication is designed to consistently replicate data between SEP sesam Remote Device Servers (RDS), including the Backup Server. The replication searches only for new blocks of data on the source media pool and replicates those changes to a target media pool according to the defined schedule. Replication means that only changed data blocks are sent over a network and backed up to the target server, which significantly reduces the data transferred over the network. This feature enables administrators to set up automatic, scheduled restores of RHV virtual guests at a disaster recovery site as cloud standby systems. Note that SEP sesam replication can be performed from ¨n¨ SEP sesam RDS Servers (or SEP sesam Backup Servers) to ¨n¨ SEP sesam RDS Servers (or SEP sesam Backup Servers).

SEP Si3 target deduplication is easy to configure and ready to use by selecting the Si3 Deduplication datastore type in a dropdown menu.
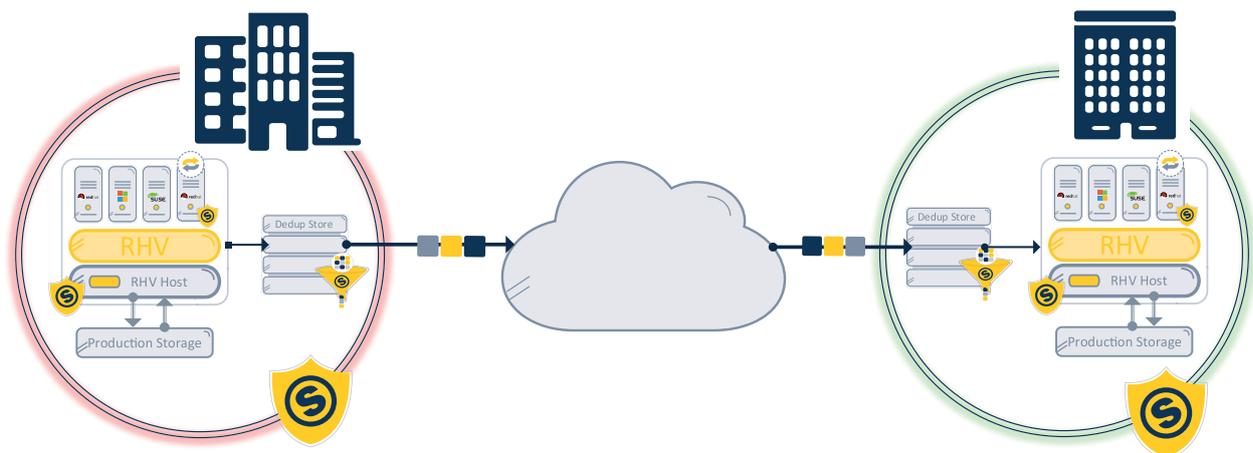
2.8. Protection of Newly Deployed VMs

The protection of dynamic virtualized RHV environments needs special attention. Newly deployed VMs have to be set up as new backup tasks. To detect all virtual guests of the RHV hypervisor, SEP offers a script to easily set up new backup tasks for new VMs.

2.9. Database and Application Vendors' Instructions

Part of the beauty of SEP sesam's integration with RHV is that any VM workload can be snapshotted uninterrupted and considered to be consistent.

Please note that vendors' backup and restore specifications for databases and applications must be considered.

Regardless of the workloads, the deployment process is simple for all VMs whether they are a Windows based Exchange server or a Linux based SAP or Oracle database.

2.10. Security

SEP sesam is capable of providing many options to enhance security and assist with meeting compliance requirements:

- The backup data streams can be encrypted to protect access to the guest virtual machine backup from unauthorized users.
- Logs can be sent to a syslog server to maintain a single centralized location for tracking information.
- Notifications can be sent to email addresses to provide immediate alerts for failed or completed jobs.

These options are all part of the SEP sesam notification system that can be used to bring backup information into a centralized audit system.

Summary

SEP sesam's native Red Hat Virtualization backup provides a simple and efficient way to architect backup of Red Hat Virtualization environments. Data can either be transferred using LAN or directly to the SAN itself, as preferred, and as best suits the installed environment. Configuration is quick and easy and when combined with technologies, such as an SEP sesam Si3 Deduplication store, efficient block-level deduplication and replication is possible, ensuring an ideal configuration of DR environments, along with efficient space utilization for multiple VM backups.

SEP sesam features an intuitive GUI that can be run either locally on the backup server or remotely from a client of your choice, and makes it simple to enter all configuration data required to complete the setup. Monitoring backup health and status is equally as simple and straightforward.

Restoring VMs is as easy as backing them up and entire VMs can be restored quickly and easily – everything from the VM configuration – down to the virtual disks that hold its data will be restored so you can be back up and running again as fast as you can transfer the backup data to the Red Hat Virtualization cluster. Backups can even be duplicated to another site using one of a number of replication technologies and, therefore, SEP sesam can become a core part of your multi-site disaster recovery strategy by virtue of its integration with Red Hat Virtualization.

Link Collection

For more technical information on the SEP integration with Red Hat Virtualization, go to:
http://wiki.sepsoftware.com/wiki/index.php/RHV_backup

Install the full version of SEP sesam today for a 30 day trial, which includes full support.
https://www.sepsoftware.com/download

SEP's support matrix lists a market leading variety of virtualization platforms, operating systems, databases and applications that can be successfully backed up and restored.
https://www.sepsoftware.com/supportmatrix

On Demand Webinar | SEP sesam Hybrid Backup Introduction & Live Demo
https://www.youtube.com/watch?v=P4cFUDf7wUA

PowerPoint Presentation Backup and Recovery RHV (Login at SEP Partner Lounge - SEP Resellers only)
https://www.sep.de/fileadmin/user_upload/Partner_Lounge/de/07.2_EN_RB_Backup_und_Recovery_RHV.pptx

Press Release | SSEP Backup and Disaster Recovery announces Snapshot Backup for Red Hat Virtualization 4
http://www.sep.de/fileadmin/user_upload/Press/en/2016-08-25_SEP_RHV4_BackupRelease_RH_approved.pdf

Press Release | SEP sesam Hybrid Backup now supports Red Hat Virtualization backup API for consistent data protection
http://www.sep.de/fileadmin/user_upload/Press/en/2015-10-04_SEP_RHV_RedHat.pdf

Analyze backup storage savings with the SEP sesam Si3 Deduplication Technology:
http://www.sepsoftware.com/tachometer

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About Red Hat Virtualization

Red Hat Virtualization is the only end-to-end, fully open source, enterprise-ready virtualization platform. It helps organisations to build an agile and secure virtualization layer with all the features of a modern hypervisor together with high availability and clustering.

Red Hat® Virtualization is a complete virtualization management solution for virtualized servers and workstations. Co-engineered with Red Hat Enterprise Linux®, Red Hat Virtualization takes organisations beyond bare metal to meet their critical business demands. It provides the performance advantages, integrated platform with the existing infrastructure, competitive pricing, and the trusted, stable environment customers expect from Red Hat.

About SEP AG

SEP is a vendor of backup and disaster recovery solutions for the protection of cross-platform, heterogeneous IT environments.

SEP provides the most comprehensive and highly scalable back up and disaster recovery solution in the industry, SEP sesam. This award-winning, flexible software can backup and manage environments of any size and complexity. SEP software is designed for multi-O/S client/server architectures from small datacenters to large, multi-location, heterogeneous data processing environments.

With SEP sesam, the backup and recovery of all common operating systems, hypervisors and virtual environments, along with a multitude of applications and databases, is achieved every time. Deduplication and replication capabilities across distributed locations - as well as archiving - are key features. Migration of data is scheduled automatically, regardless of storage technologies.

With the solutions that SEP offers, business-critical data is always available, saving time and reducing capital and operating costs. www.sepsoftware.com

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