



SEP

The Data Protection Company

SEP sesam

Proxmox VE Backup & Restore

many functions, comfortable, high-performance, scalable, reliable

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Introduction

Proxmox VE is a valid open-source alternative to VMware, Microsoft Hyper-V or other virtualization solutions. As a product, it is characterized by its small size combined with a high level of user-friendliness and functionality. It offers both cluster and container technology.

As a solution from Austria, it helps to deal with formal regulations such as GDPR, NIS2 or the US Cloud Act. Based on Debian Linux, it increases protection against ransomware.

Due to the takeover of VMware by Broadcom and the accompanying drastic price increases, the demand for Proxmox has increased enormously. Anyone who has always flirted with switching to an open-source solution is now setting up such a project. But many other unnerved VMware customers are also evaluating a migration of their virtual environment.

The same applies to many users of Citrix XenServer, because here too there was a surprisingly large increase in license costs.

Proxmox also offers its own backup solution: the Proxmox Backup Server (PBS). Even though this is limited exclusively to the backup of Proxmox VMs, the PBS offers a range of convenient backup functions through the use of proprietary APIs, especially in comparison with the competition on the backup market. Many customers have therefore decided to use PBS as a dedicated stand-alone solution - in addition to their existing backup product.

Although the PBS offers some added value for the backup of a Proxmox environment, as an isolated solution it contradicts a backup consolidation in terms of backup concept and central control, Administration, know-how, etc.

For example, the deduplication of the PBS cannot be combined with the highly efficient and global S3 deduplication of SEP Sesam.

The limited support time of the PBS to 5x9 also has an inhibiting effect in the enterprise environment.

Further information on Proxmox VE and the PBS:

www.proxmox.com



To solve the challenges mentioned above, we recommend using the professional backup software 'SEP Sesam', which offers unique added value for backing up and restoring VMs in Proxmox VE environments with its considerably extended backup and restore functions.

Prerequisites

Proxmox VE offers a variety of different options for connecting the storage for the VMs. An overview of the storage types possible with Proxmox VE can be found here:

<https://pve.proxmox.com/wiki/Storage>

The backup wizard for Proxmox VE, which has been available with SEP Sesam for several years, enables the backup of ALL storage types with Proxmox's own backup API 'vzdump'. Although the method via 'vzdump' has the advantage of being completely storage-independent, it has some significant disadvantages such as

- Only full backup and restore of a complete VM
- Data stream in proprietary and permanently changing format, which allows neither mounting for SFR nor efficient deduplication
- Limited parallelism etc.

The backup method via 'vzdump' is still available in SEP Sesam to enable a basic backup of all Proxmox VE configurations.

To be able to use the extended set of backup and restore functions with SEP Sesam, a block-based storage type must be in use. The storage-based snapshots also enable an online backup of the VMs. Unfortunately, the underlying method of storage snapshots is not possible with all file-based storage types (e.g. nfs or cephFS) or when using LXC.

The following 3 block-based storage types are currently supported for the extended functions:

- LVM (thin provisioning)
- zfs (local)
- CephRBD

A detailed description of the SEP sesam functionality and its configuration can be found in our Wiki:

https://wiki.sep.de/wiki/index.php/Proxmox_VE_Backup#Overview

Backup

For the 3 block-based storage types mentioned above, the SEP backup method is based on direct access to the storage to trigger storage snapshots. This results in completely new functionalities as added value, which users migrating from VMware or Citrix in particular are already accustomed to and which are indispensable for an enterprise-capable, convenient backup.

- Incremental backup by comparing snapshots
- Improved performance compared to 'vzdump'
- Enterprise-capable thanks to many parallel streams, i.e. simultaneous backup of many VMs
- Automatic detection of the most suitable backup option
- Efficient application of the global deduplication Si3 integrated in SEP Sesam

Other comfort functions already available for all hypervisors supported by SEP can of course also be used for Proxmox VE:

- Define policies for newly recognized VMs
=> Automated inclusion of new backups in the existing backup processes
- Automatic follow-up actions after a successful backup
=> e.g. migration to tape or to the cloud
- Simple configuration of Proxmox VE back-up tasks via WebUI
(from the next major version in Q1/25)

The screenshot shows the 'Advanced Options for Backup Task' configuration page in the Proxmox VE WebUI. The page is titled 'Advanced Options for Backup Task pxmx-node1_Proxmox-VE_101'. On the left, a sidebar shows a progress indicator for the configuration steps: 1 Client selection, 2 Task type selection, 3 Configuration - Virtual machine, 4 Advanced Options (selected), 5 Type of scheduling, 6 Backup group configuration, 7 Confirmation, and 8 Finish. The main content area contains the following options:

- Access:** Fields for 'Account:' and 'Password:'.
- Encryption:** A toggle switch is currently turned off, with the text 'Backup encryption disabled.'
- Compression:** A toggle switch is currently turned off. Below it, a note states: 'On Linux, compression is not possible due to the CPIO archive format used (CPIO is a fixed length archive format. So item size, which will be saved has to be known at the beginning of backup of item. Size is written into cpio file header).'
- Backup Method Selection:** A list of radio buttons with the following options and descriptions:
 - Automatic**
 - Backup via VZDUMP**
When backing up via vzdump, incremental backups are not possible and the deduplication rate deteriorates.
 - Backup via ZFS snapshot**
Incremental backups are not possible if the backup is made via ZFS.
 - Backup via Ceph/Rados block device snapshot**
Incremental backups are possible if the backup is made via RBD.
 - Backup via LVM snapshot (on thin provisioned storage)**
Incremental backups are possible via LVM if all disks of the VM are on thin-lvm.
- Pre / Post interface settings:** A text input field with a right-pointing arrow.
- Additional call arguments:** A text input field with a right-pointing arrow.

At the bottom right of the configuration area, there are three buttons: 'Cancel', 'Back', and 'Next'.

Restore

The use of storage snapshots has also made restoring much easier:

- Restore an entire VM with overwrite: YES/NO
- Mounting the backup for Single File Restore for LVM-thin and cephRBD (also from a Si3 Dedup Store, Linux and Windows)
- Restore with new name
- In addition to the cryptic VM IDs, the VM name is now also displayed
- Parallel restore of many VMs (-> disaster recovery)

However, functionalities already available from the restore of other hypervisors can also be used for the Proxmox VE restore:

- Restore to other Proxmox VE environments (e.g. DR at another location).
Notes:
 - For storage snapshot backups, the storage type must match, i.e. zfs to zfs etc.
 - The source and target storage type can be different for v2dump backups
- Automatic start of a VM after the restore
- Intuitive restore via WebUI

Start ✓ Virtual Machine ✓ **Task** Files Target Options Finish

Reload Date range of backups: 06.11.2024 – 14.11.2024

Task selection

Task	Source
pxmx-node1_pxmx_108	108

Backup selection Selected backup: SI20241114132304053@PVCrvyOn5Uu 14.11.2024 13:23:04

Backup date	Level	Saveset	Size	Copies	Media Pool
14.11.2024 13:23	INCR	SI20241114132304053@PVCrvyOn5Uu	3,5 KB	1	si3-pool
13.11.2024 13:23	FULL	SF20241113132302285@md68FX2sEN0	7,0 GB	1	si3-pool
12.11.2024 13:23	INCR	SI20241112132306053@IKkYlrz6vrxg	3,5 KB	1	si3-pool
11.11.2024 13:23	INCR	SI20241111132306336@YyO0B5B1rjk	3,5 KB	1	si3-pool
10.11.2024 17:23	COPY	SC20241110172304015@w4QFgdMblgA	7,0 GB	1	si3-pool
10.11.2024 13:23	FULL	SF20241110132304264@Wjg1bpZGFEG	7,0 GB	1	si3-pool
09.11.2024 13:23	FULL	SF20241109132305076@zw1coKT0ob4	7,0 GB	1	si3-pool
08.11.2024 13:23	INCR	SI20241108132304531@RZ1aYWJUL8	3,5 KB	1	si3-pool
07.11.2024 13:23	INCR	SI20241107132305067@HHtipuTShcT	3,5 KB	1	si3-pool
06.11.2024 13:23	FULL	SF20241106132305629@IINMVq9s5Hc	7,0 GB	1	si3-pool

Generation restore Single file restore Virtual machine restore

Cancel Advanced View Back Next



DISCLAIMER!

The information contained in this chapter was provided to us by external parties and can neither be denied nor confirmed by us as SEP. Furthermore, it cannot be ruled out that the facts described will be outdated or obsolete sooner or later, as the strategies and releases of the competition are constantly changing.

Competition

Veeam

Anyone looking around the market for Proxmox Backup will inevitably come across Veeam. The top dog in the VMware sector has publicized its activities for Proxmox VE with great marketing effort. The feedback from practically all Veeam resellers and customers who have tested this new agent has been consistently devastating. There is unanimous incomprehension as to why Veeam does Proxmox Backup the way it does. According to the testers, the result is unstable, unreliable, unscalable, and does not perform.

Technically, a VM must be mounted to a proxy VM for backup, similar to the VMware HotAdd. The parallel backup of a second VM requires a second proxy VM, which inevitably results in limits in terms of scalability and performance.

Furthermore, the testers reported license problems. The Veeam subscription model allows free switching between VMware and Hyper-V. A switch to Proxmox VE allegedly initiates a change of the license model to capacity licenses, which requires the purchase of additional licenses.

Commvault

Commvault, with its broad support matrix, supported the Proxmox VE backup until a few years ago. This agent was discontinued some time ago.

Since Proxmox is experiencing this enormous upswing primarily in the European market and is hardly known in the USA, Commvault's headquarters in the USA cannot currently decide to invest in development costs. US companies find it difficult to support products that are hardly known in the US.

NetBackup

According to Veritas' current support matrix, NetBackup does not currently support the backup of Proxmox VE as a hypervisor:

https://www.veritas.com/support/en_US/doc/25074086-149019166-0/v142119812-149019166

Discussions about the missing Proxmox support of NetBackup can be followed here:

<https://vox.veritas.com/discussions/netbackup/proxmox-backup-with-netbackup/904294>

Outlook

- In order to better meet the particular market trend of switching from VMware to Proxmox VE SEP is currently evaluating how we can integrate the migration of VMware VMs into Proxmox VE more conveniently.
A script-based transfer of the VMs using external conversion tools is always a viable path
- Zfs over iSCSI is also zfs and block-based, but is currently not supported
- The alternative method of reading the INC backup via the Qemu API, as used by the PBS, is being pursued but is currently not implemented in SEP Sesam
- SEP Sesam cannot restore VMs that originate from an encrypted zfs. Proxmox itself cannot yet do this either, but is already working on a solution for this
- Since the storage snapshot method is independent of Proxmox, it can also be generally offered in SEP Sesam when using these file systems for backup