

The background features several decorative wireframe spheres composed of interconnected white lines and dots, positioned in the corners and center of the page. The main title is centered in a large, bold, white font on a dark grey rectangular background.

Proxmox VE Backup & Restore

Many functions, comfortable, High-performance, scalable, reliable

The logo for SEP (The Data Protection Company) features the letters 'SEP' in a bold, white, sans-serif font. A small yellow square is positioned above the letter 'P'. Below the logo, the text 'The Data Protection Company' is written in a smaller, white, sans-serif font.

SEP
The Data Protection Company

The logo for THOMAS KRENN features the name 'THOMAS KRENN' in a bold, white, sans-serif font. The letter 'O' in 'THOMAS' is replaced by a horizontal orange bar. Below the name, the tagline 'IT's people business' is written in a smaller, white, sans-serif font.

**THOMAS
KRENN**[®]
IT's people business

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Proxmox VE Backup & Restore

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

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 high user-friendliness and functionality. Proxmox VE offers both VM technology (based on KVM) and container technology using Linux Containers (LXC). To protect against system failures, Proxmox VE also offers cluster operation of multiple servers including high availability.

As a solution from Austria, it helps to make it easier to comply with formal regulations such as GDPR, NIS2 or the US Cloud Act. Based on Debian GNU/Linux, it increases protection against malware, among other things.

Due to the takeover of VMware by Broadcom and the drastic price increases that came with it, demand for Proxmox VE 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.

In addition to its hypervisor, Proxmox also offers its own backup solution:

The Proxmox Backup Server (PBS)

Even if it is limited exclusively to the backup of Proxmox VMs and containers, PBS offers a range of convenient backup functions using 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 generally valid backup consolidation in terms of backup concept, central control, administration, know-how, etc.

For example, the deduplication of the PBS cannot be combined with the highly efficient and global Si3 deduplication of SEP sesam. The limited support time of the PBS to 9x5 also has an inhibiting effect in the enterprise environment.

Further information on Proxmox VE and the PBS:

[Proxmox](#)



To solve the above-mentioned challenges, we recommend using the professional backup software SEP sesam, which offers unique added value with its considerably extended backup and

restore functions when backing up and restoring VMs in Proxmox VE environments. A first insight into the SEP Proxmox functionality can be found here:

[Proxmox Features](#)

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:

Storage types

The backup agent 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` offers 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.

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*
- *integrated global deduplication Si3*

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

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:

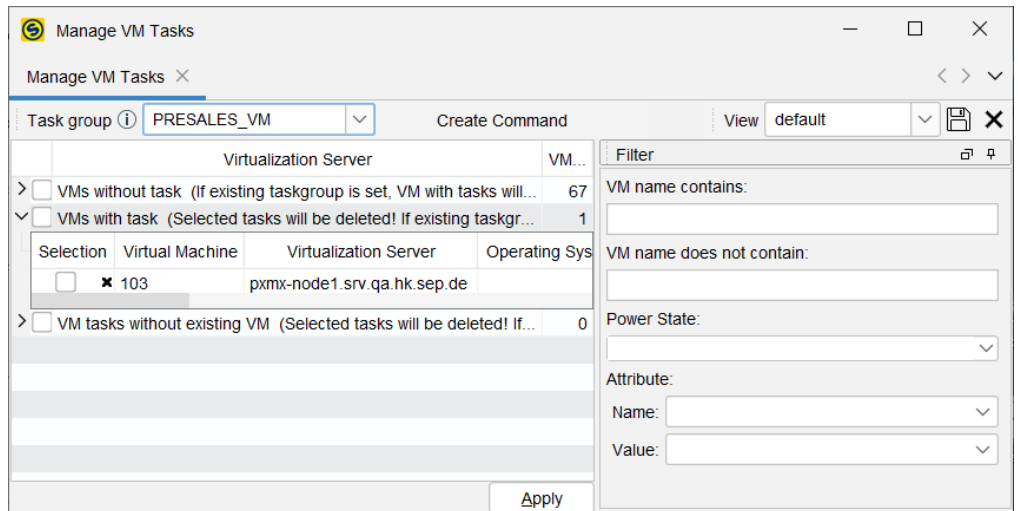
Further information:

[Proxmox VE Backup](#)

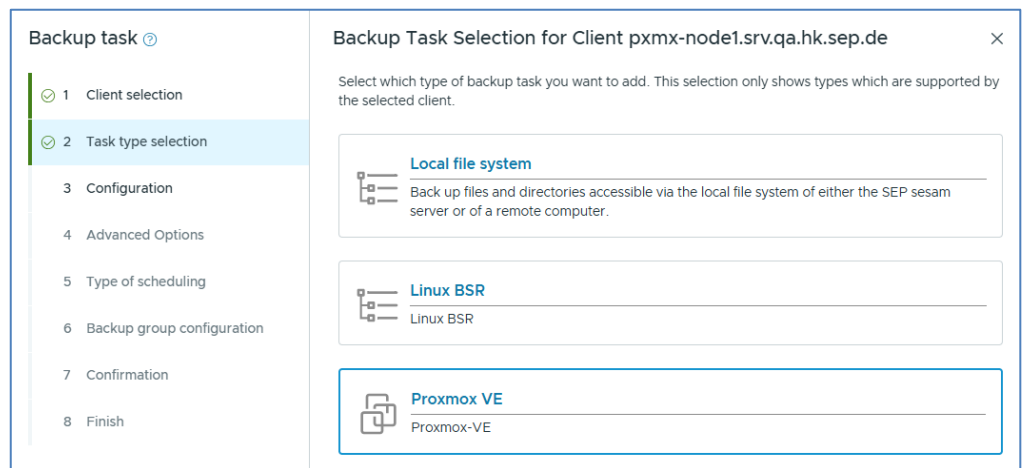
- *Define policies for newly recognized VMs
=> Automated inclusion of new backups in the existing backup processes*
- *Automatic follow-up actions after a successful backup
=> e.g. migration to tape or to the cloud*
- *Create or delete lots of backup tasks for a predefined task group with just one click from the dialog 'Manage VM tasks'*

Another added value with SEP sesam is the ability to back up the Proxmox nodes themselves, regardless of whether it is a single node or a cluster configuration.

Since a SEP client package must already be installed on each node and the SEP Linux Agent also supports Debian, a complete file backup of the node or even an image (BSR) backup of the computer can be made. Since all Proxmox configuration files on the node as well as the OS of the node are backed up, this significantly increases the security and availability of your virtual environment, especially in the event of disaster recovery, e.g. hardware failure. Thanks to the BSR backup, a restore to new HW is possible without any problems, even if this requires minor manual intervention.



Simple configuration of Proxmox VE backup tasks via WebUI:



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 all 3 block-based storage types (also from a Si3 Dedup Store, Linux and Windows)*
- *Restore with new name*
- *Restore with new ID*
- *In addition to the cryptic VM IDs, the VM name is now also displayed*
- *Parallel restores of many VMs (-> disaster recovery)*

Hint:

In the event that a VM uses several virtual disks that are located on different storage types, the restore will fail!

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

- *Automatic start of a VM after the 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.
- For v2dump backups the source and target storage type can be different

- *Intuitive restore via WebUI*

The screenshot shows the SEP sesam backup software interface. At the top, there are navigation tabs: 'Start', 'Virtuelle Maschine', 'Auftrag', 'Ziel', 'Optionen', and 'Abschluss'. Below this, there's a 'Neu laden' button and a date selector for 'Zeitraum der Sicherungen: 10.04.2025'. The main area is divided into two sections: 'Auftragsauswahl' and 'Sicherungsauswahl'. The 'Auftragsauswahl' section shows a table with columns 'Auftrag' and 'Quelle', containing one entry: 'ps-win' with source '129'. The 'Sicherungsauswahl' section shows a table with columns 'Sicherungsdatum', 'Methode', 'Sicherung', 'Größe', and 'Medienpool'. It lists three backup entries, with the third one selected. At the bottom, there are checkboxes for 'Generationsrücksicherung', 'Einzeldateierücksicherung', and 'Rücksicherung der virtuellen Maschine', along with 'Abbrechen', 'Erweiterte Ansicht', 'Zurück', and 'Weiter' buttons.

Sicherungsdatum	Methode	Sicherung	Größe	Medienpool
10.04.2025 16:02	INCR	SI20250410160206113@UFzUuyqNoM	3,0 KB	Backup-Pool
10.04.2025 16:01	INCR	SI20250410160112902@ZxOL2xb658	3,0 KB	Backup-Pool
10.04.2025 16:00	FULL	SF20250410160036531@BGUJJ1VBxHk	1,0 MB	Backup-Pool
10.04.2025 15:58	COPY	SC20250410155843250@oDWU0qTWM3K	1,0 MB	Backup-Pool

Migration to Proxmox VE

To be able to use the backup and restore functions of SEP sesam for Proxmox VE, the existing VMs and containers must first be moved

from VMware to the new virtualization environment Proxmox VE. There are basically three options for how this can be done:

1. OVF Tool

The first option is to do this using the commandline tool OVF-Tools. The virtual machines can be exported directly from VMware and then imported into Proxmox VE. However, there are restrictions here. For example, live migration is not possible as the VMs must be switched off during the entire process.

storage space on the local storage to export the VMs to this storage.

This may not be the actual target storage. In practice, however, the OVF tool option has now largely been replaced by the second option, although it is still used to some extent and Proxmox continues to develop it accordingly.

In addition, there must be enough temporary

Further information (use browser utilities to translate the German page):

[VM Export & Import OVF-Tool](#)

2. ESXi Importer

The newer variant is to use the implemented ESXi Importer from Proxmox VE. The individual ESXi servers (or the vCenter) can be added in the storage settings of the Proxmox VE single host or the cluster. The individual VMs can then be imported under the added storage; in contrast to the OVF tool, this works without any major downtime. However, it is necessary that the VM is stopped on the VMware side, as otherwise an error will occur when activating the live import (this problem may already be solved if you follow these instructions).

With the live restore, Proxmox VE starts the image immediately if the VM is off on the VMware side and you have started the import. All required data is then retrieved on-demand. However, there is currently still a limitation: It is not possible to import VMs that use vSAN storage directly. The disks must first be moved to another storage to be able to use the ESXi Importer.

Further information (use browser utilities to translate the German page):

[ESXi VM Importer](#)

3. Backup and Restore

The last possible option would be to use a backup solution to back up the VMs under VMware and then restore them under Proxmox VE. Depending on the solution and the backup method used, the entire process may not work live, but it is possible to continue using the existing backups.

This means that, even after switching to Proxmox VE, the existing backups can still be used to perform a restore to an older data status. SEP is currently evaluating how this can best be implemented (see Outlook).

Outlook

To better support 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.

- *ZFS over iSCSI is also zfs and block-based, but is currently not supported due to the more complex setup with an external storage server*
- *SFR of VMs with OES/NSS can be implemented manually today with the help of SEP Consulting and will be integrated in the future*

- *The alternative method of reading the INC backup via the QEMUQEMU/QCOW2 API, as used by the PBS, is currently under development and will be released shortly*
- *SEP sesam cannot restore encrypted VMs. Proxmox itself cannot do this either, but is already working on a solution for this*
- *Since the method of storage snapshots is independent of Proxmox, it can also be generally offered in SEP sesam when using these file systems for backup*



About SEP:

SEP makes the world a little safer every day. With the hybrid backup and disaster recovery solutions, the data of companies and organizations is backed up around the clock and fully restored in the event of a disaster.

SEP's claim:

No data should be lost. That is why all components are developed, extensively tested and constantly improved.

About Thomas-Krenn:

Thomas-Krenn.AG is one of the largest manufacturers of individual server and storage systems in Germany. Since 2002, the company has been supplying end users, resellers and data center operators with high-quality hardware based on the build-to-order principle. The company stands for the highest service quality in hardware-related development, contract manufacturing, product refinement and logistics.

Thanks to customized solutions, the company is a reliable partner for industry, system houses, service providers and medium-sized end customers - from every sector. In accordance with DIN EN ISO 14001, the highest standards of sustainability and ecology are met. The company currently employs around 200 people and produces all systems in Germany at its Freyung site.



Tel: +49 (0) 8551.9150 - 300

thomas-krenn.com