

White Paper

SEP The Data Protection Company

Citrix Hypervisor: Best Practice for Data Backup and Restore

Advantages, Procedure and User Scenarios



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You can find the latest version of this white paper online at <https://www.sep.de/solutions/citrix>

1 Introduction

SEP sesam Backup and Recovery for Citrix Hypervisor, formerly XenServer, offers efficient, scalable, and easy-to-use tools for virtual environments that go beyond simple VM backups and create a solution to optimize any environment. The SEP sesam management interface (WebUI) displays all Citrix VMs, simplifying planning and execution of automated backup processes. No additional effort is required to backup and protect any Citrix Hypervisor environment.

SEP's backup and recovery solution for Citrix provides:

- Agentless backups
- VM (Virtual Machine) crash consistency
- Support of native CBT (Changed Block Tracking)
- Single File Restore from mounted backups
- Hot and Cold backups
- Platform-independent functionality
- Built-in encryption capabilities
- A single simple enterprise management interface (via Web Interface or GUI)
- Certified solution for Citrix Hypervisor

2 Overview

2.1 Citrix Hypervisor Backup Methods

There are several ways to back up VMs on Citrix Hypervisor with SEP sesam:

- Offline Backup – occurs when the VM is powered down
- FULL Backup – A full backup of a Citrix VM is done using CBT
- INC Backup – Incremental Backup of a Citrix VM based on CBT
- COPY Backup – A complete copy of a VM is done without interference into all current generation chains

All backup methods are fully accessible from and integrated into the SEP sesam central interface and WebUI.

2.2 Security

SEP sesam can provide many options to enhance security and assist in meeting compliance requirements:

- Backup data streams can be encrypted to protect against unauthorized access
- Logs can be sent to a syslog server to maintain a single centralized location for tracking information
- Notifications can be sent to email addresses or mobile phones to provide immediate alerts for failed or completed jobs

2.3 Feature-Rich

Additional features of using SEP sesam for Citrix Hypervisor backups:

- SEP sesam leverages Citrix Hypervisor's integrated software compression to stream small files to the backup media
- SEP's patented Multi-Streaming Technology can also be leveraged to simultaneously backup and restore multiple VM's to multiple nodes within the Citrix Hypervisor clustered pool.
- SEP sesam is optimized to allow backups for VMs on 64-bit platforms
- A Remote Device Server can be configured to allow backups to occur at a remote location and still be operated by the central management console

2.4 High Availability

SEP sesam fully supports the backup of all VMs in a high availability Citrix Hypervisor cluster environment.

As SEP sesam communicates directly with the Citrix Hypervisor's clustered pool, backup tasks can properly follow virtual machines if they have failed over to a different Citrix Hypervisor cluster host.

Only the Poolmaster must be configured in SEP sesam as a hypervisor server and SEP sesam only communicates with this Poolmaster.

The configuration of a Citrix Hypervisor Client in SEP sesam will be shown in the section "Best Practice".

3 Best Practise

3.1 Prerequisite Checks and Configuration

Configuration:

SEP sesam integration in connection with the Citrix Hypervisor. Note that the procedures presented in this article and the configuration steps required to set up the Citrix Hypervisor in SEP sesam require a preliminary check.

Client citrix3.sep.de

Client Options Permissions Citrix XenServer

Properties

Name or IPv4-Address: citrix3.sep.de

Location: Virtualization/Citrix_XenServer

Virtual machine:

Operating system: Citrix XenServer

Virtualization server:

Virtualization server type: Citrix Hypervisor

Access mode: PROXY

Last SEP sesam message:

Last successful access:

Notes:

Interfaces: citrix3.sep.de
http://citrix3.sep.de:11000
https://citrix3.sep.de:11443

SEP sesam version: SBC version:

Do not update this client

Execution of backups

Execution off

Create New OK Delete Apply Cancel

Citrix Hypervisor Requirements and Configuration:
https://wiki.sepsoftware.com/wiki/index.php/5_1_0:Citrix_Hypervisor_Requirements_and_Configuration

4 Backup

4.1 Offline Backup

The offline backup solution will perform a backup of the VM by shutting down the operating system. This option allows the backup to occur when no changes are occurring on the VM. While this guarantees the consistency of the VM at a specific point in time, it is not an optimal solution for applications that require high availability.

Pros:

- All data is in a consistent state
- Operating system independent
- Application independent

Cons:

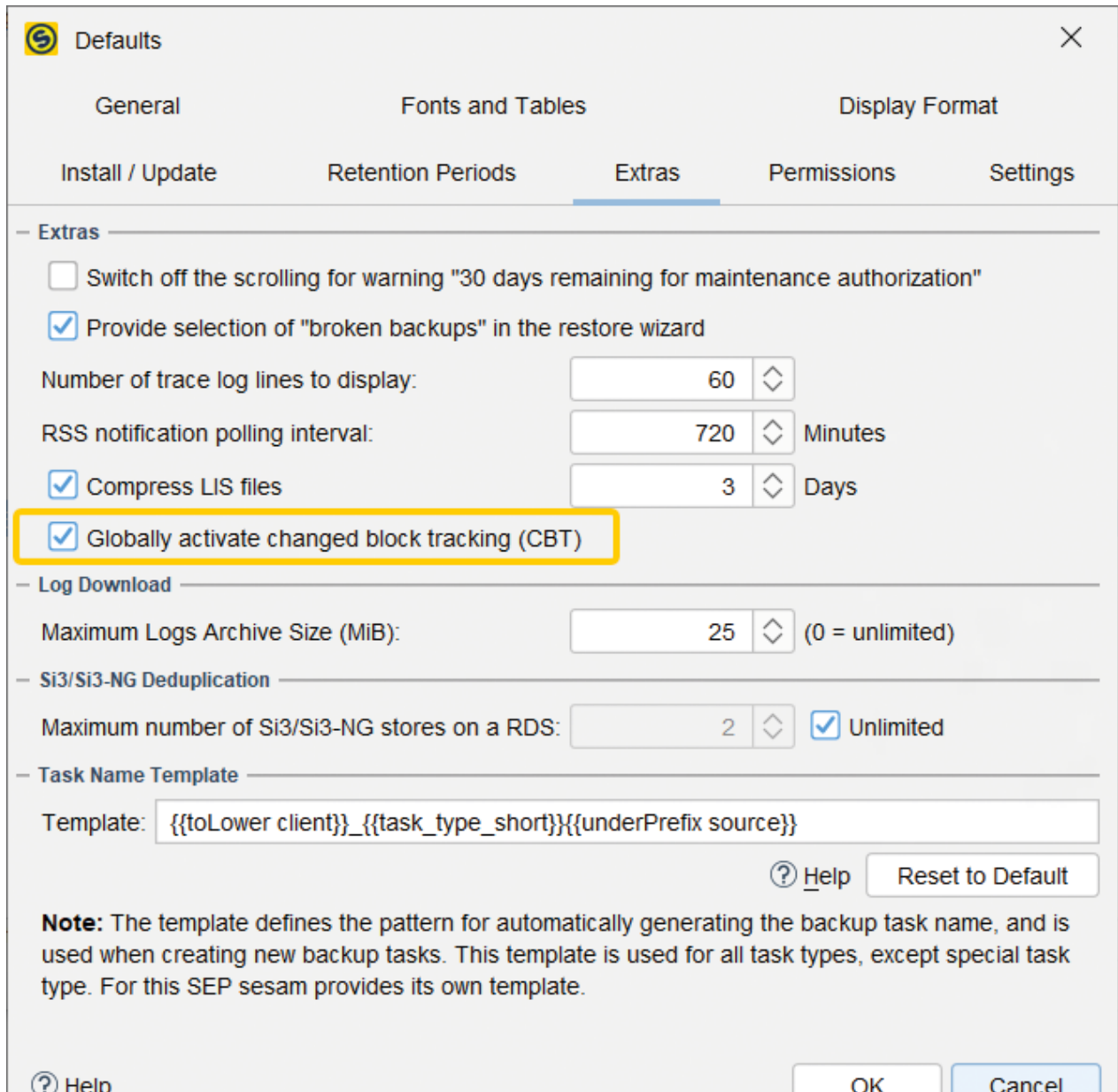
- The VM is offline for the entire backup time frame

4.2 Changed Block Tracking (CBT)

The Changed Block Tracking (CBT) feature is a changed block tracking feature and offers incremental backup technology using Citrix Hypervisor. This feature requires an adequate edition of Citrix Hypervisor.

If changed block tracking is enabled, it will offer this functionality for virtual disk images (VDIs). All changed blocks will be logged in a separate file. While running a snapshot of the VDI, the log file can be used to compare changed blocks since the last snapshot. With CBT you can then backup those changed blocks.

The changed blocks themselves are not stored, instead the disk's uuid + base snapshot uuid are saved. Thus changed blocks are then retrieved using a Xen API call and providing the uuid's of the two relevant checkpoints as reference object. Afterwards only those blocks are backed up by SEP sesam.



4.3 Normal Backup

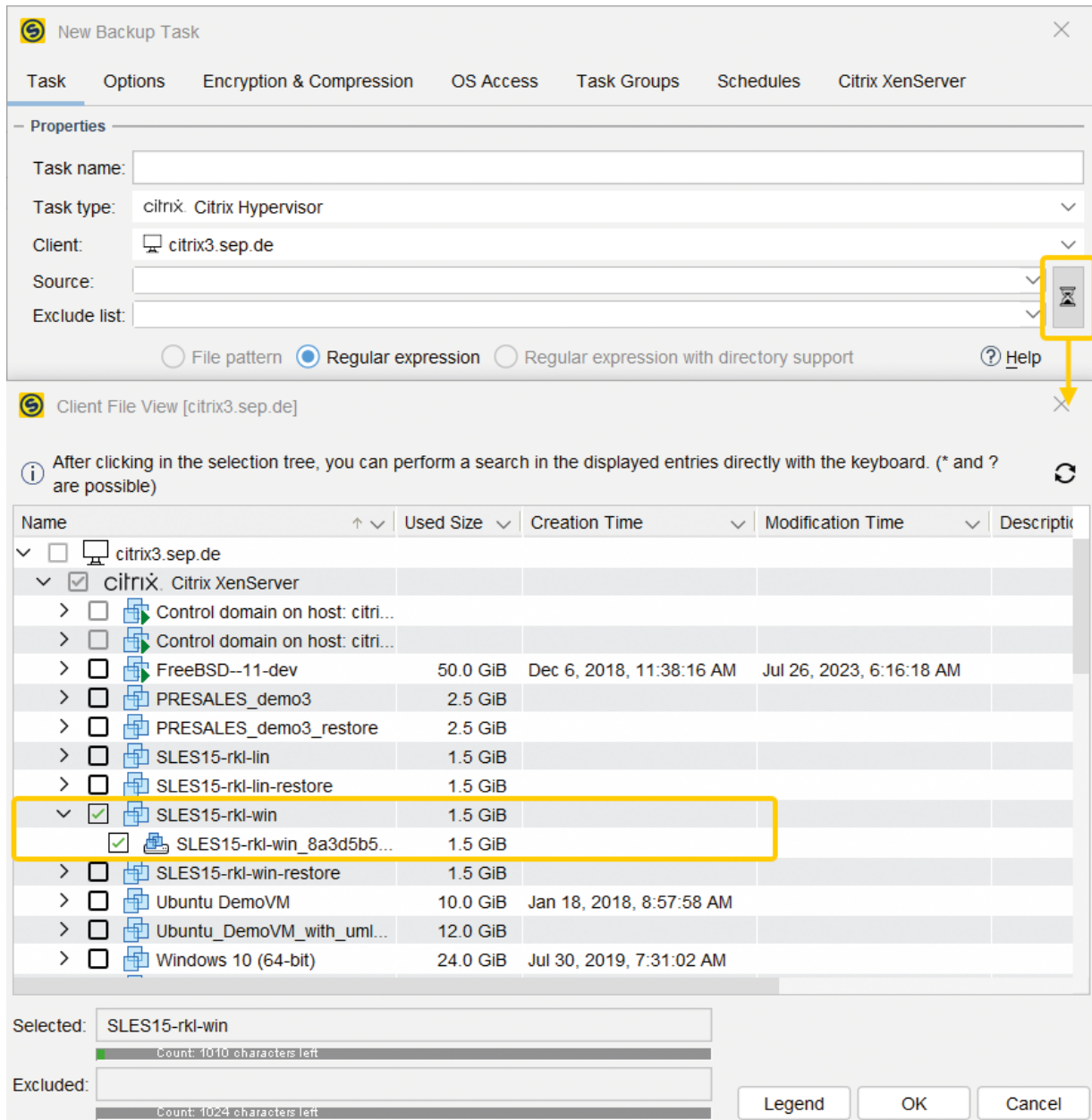
The online normal backup solution will perform a backup of an active VM on the fly. This provides better performance for active users or processes accessing the VM, eliminating any downtime during the backup. This process will back up the VM configuration, storage information, and VIF's on any operating system.

Pros:

- No downtime required on the VM

Cons:

- Cannot guarantee the consistency of the data that is in active memory
- Does not work with all applications

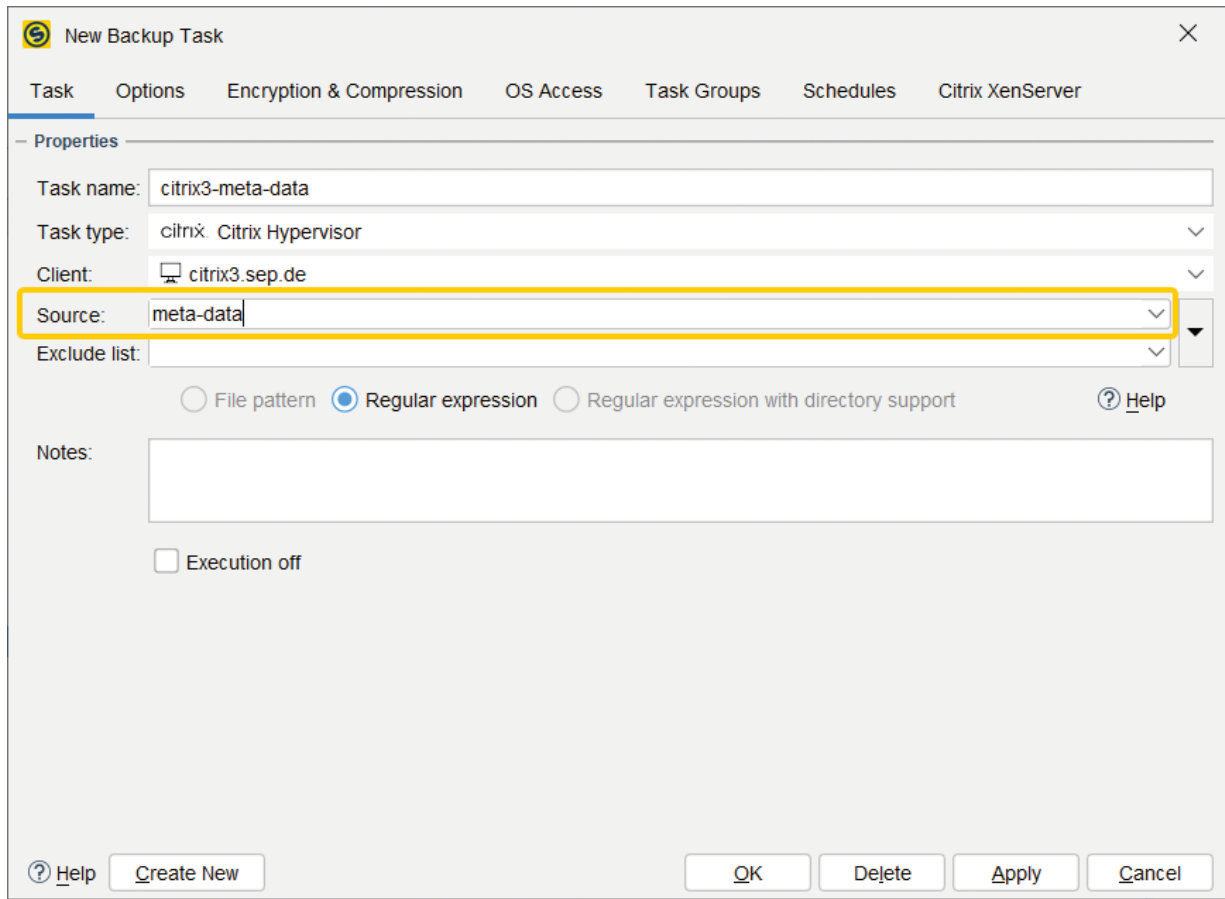


Citrix Hypervisor Backup:
https://wiki.sepsoftware.com/wiki/index.php/Citrix_XenServer_Backup

4.4 Metadata Backup

The backup includes the XenServer pool database and the needed metadata of the pool.

Note:
 Citrix recommends that you perform metadata backup via Citrix native backup options as often as necessary.



4.5 Agentless Backup

The SEP sesam server can communicate natively with the Citrix Hypervisor environment using Easy Access Technology (EAT), eliminating the need for a backup agent on the Citrix Hypervisor.

This optimizes backup performance and reduces the need to communicate with agents on the VMs (note: depending on the state of application data, this should not be the only backup method utilized to provide consistent backups).

Communication to the Citrix Hypervisor can be initiated from any SEP sesam Client, RDS or Server, optimizing the backup strategy for network performance while still providing centralized management. The client initiating this process is called "Datamover" and can be set within the client properties -> Tab "Citrix XenServer".

Since SEP sesam communicates directly with the Citrix hypervisor, it does not matter what operating system is running as a VM. Windows, Linux, or any other operating system is treated as a VM and backed up directly via the Citrix Hypervisor.

Pros:

- Easy to configure, best for multiple VM's, and complete Backup

Cons:

- VM Agents should be used for consistent backups of databases and any other high level applications

VSS and quiesced snapshots are no longer supported by Citrix Hypervisor.

VSS and quiesced snapshots of Windows VMs are only supported in Citrix Hypervisor 8.0 and earlier versions; they have been removed in Citrix Hypervisor ≥ 8.1 and in the version $\geq 9.0.x.x$ drivers. If you want to continue using the quiesced snapshot feature with Windows VMs hosted on Citrix Hypervisor 8.0 and earlier, retain your current 8.2.x.x version of the Windows I/O drivers and do not update to the 9.0.0.x drivers. For more information, visit the Citrix Website (Citrix Hypervisor 8.1 Deprecations and removals):
<https://docs.citrix.com/en-us/citrix-hypervisor/whats-new/removed-features.html>

4.6 Administration of large number of VMs

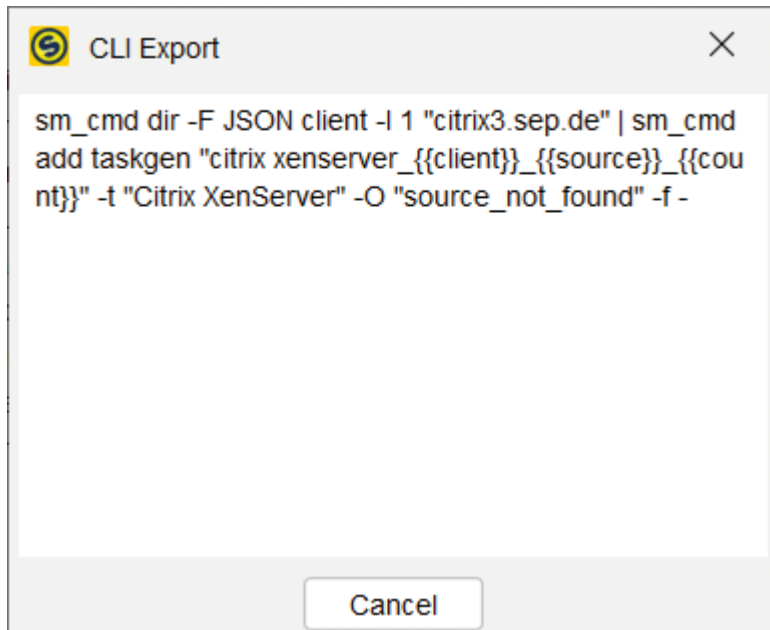
From the menu item “Manage VM tasks” you can see and administer your entire virtual environment with all the VMs in just one dialogbox. You can easily filter, select and create multiple tasks for a certain task group with just one click.

4.7 Automatic Backup of new VMs

One experience from SEP support shows that in crisis situations, the problem is often not the actual restore, but that important data was simply not backed up at all. Changes to the data infrastructure were inadvertently not tracked in the backup. And where there is no backup, nothing can be restored.

This is exactly the situation SEP sesam can remedy.

An algorithm detects new Citrix VMs and automatically creates new backup tasks according to predefined policies, so that the new VMs are immediately backed up and never forgotten again. Since the policies are designed like a programming interface, it offers a wide range of definition possibilities. For example, new VMs can be classified by regular expressions of VM names or filtering of metatags by production or test VMs, and backup tasks can be automatically created in predefined task groups or schedules.



This powerful tool can be applied not only to all hypervisors supported by SEP sesam, but also to all databases.

No important VM will ever be forgotten again and the completeness of the backups is absolutely guaranteed.

Automating the Backup Process:
https://wiki.sepsoftware.com/wiki/index.php/5_0_0:Automating_Backup_Process

5 Restore

The simplicity of the SEP sesam management interface allows for quick and easy restores. SEP sesam includes the capability to use a point-in-time backup to restore any snapshot, from any time.

A VM can be restored to the same location or to a different location. This allows a VM to be restored without downtime on any Citrix Hypervisor connected to the network.

These features can be used to schedule VM replication or even to export VMs to onsite or off-site systems. After a replication restore has been completed, the startup type can be set to "offline" to avoid network conflicts.

This allows the use of the same UID for the restored VM or even assignment of a new UID during replication.

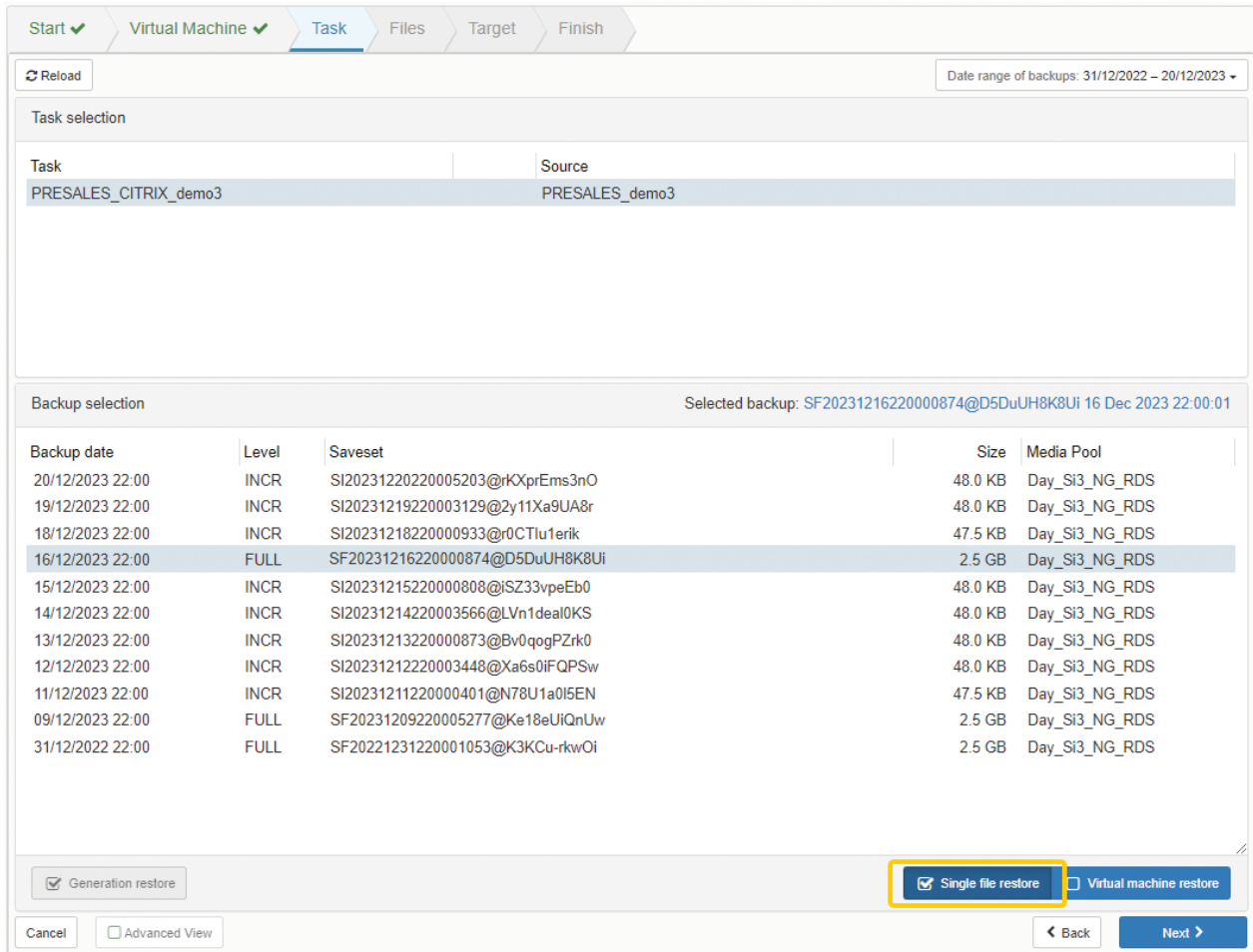
Citrix Hypervisor-Restore:
https://wiki.sepsoftware.com/wiki/index.php/Citrix_XenServer_Restore

5.1 Single File Restore

SEP sesam supports single file restore – item-level restore of files, folders, and volumes from the FULL, DIFF or INCR backup of the Citrix Hypervisor virtual machine if the saveset is stored on a SEP sesam data store (Path, Si3 deduplication store, etc.). By mounting the VHD, the operating system creates a virtual drive from the file, assigns it a drive letter, and makes the drive available locally on your server.

You can restore single files using the WebUI Restore Assistant (in Version $\geq 5.0.0.x$ Jaglion).

The screenshot shows the 'Options' step of the WebUI Restore Assistant. The 'Citrix Hypervisor / XCP-ng' option is selected and highlighted with a yellow border. Other options include VMware vSphere, Microsoft Hyper-V, KVM / QEMU, Nutanix-AHV, Oracle Linux Virtualization, Red Hat Virtualization, Open Nebula, Proxmox VE, Kopano Groupware, Micro Focus GroupWise, Microsoft Exchange, Microsoft SQL Server, HCL Domino, MySQL/MariaDB, PostgreSQL, NetIQ eDirectory, and Micro Focus iFolder. The 'Next >' button is visible at the bottom right.



Note that this article only describes the procedure for restoring individual files from a Citrix Hypervisor VM. For details on full VM restore, see Citrix XenServer Restore via the GUI (https://wiki.sepsoftware.com/wiki/index.php/5_0_0:Citrix_XenServer_Restore) or the WebUI Restore Assistant (https://wiki.sepsoftware.com/wiki/index.php/5_0_0:Restore_Assistant/de#VMs_restore).

6 Conclusion

SEP sesam is one of the most robust and scalable backup solutions on the market today. The single interface to manage all backup agents and device servers, whether local or remote, makes it the perfect solution and scales up from small to larger business environments. Busy network administrators especially appreciate the ease of implementation of SEP sesam for their Citrix Hypervisor environments. Installation is quick and seamless due to the direct communication with the Citrix Hypervisor and creating a backup task is quick and easy with SEP sesam.

Experience the benefits SEP sesam has to offer by downloading a 30-day full version at www.sepsoftware.com.

7 Resources

30-Day Full Version



The SEP sesam 30-day full version includes all the features for an optimal data backup and restore as well as free personal demo support.

<https://www.sep.de/download>

SEP sesam Support Matrix



SEP sesam supports a wide range of operating systems, databases, virtualization platforms, applications and hardware snapshots.

<https://www.sep.de/supportmatrix>

Documentation



The complete and comprehensive documentation for SEP sesam including Quick Start guide, trainings, tutorials and release notes makes data protection transparent.

<https://wiki.sep.de>

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About Citrix Hypervisor

Citrix Hypervisor, formerly Citrix XenServer, is a virtualization platform for Windows and Linux servers based on the Xen Hypervisor. By virtualizing the servers, operation in the data center can be automated, resulting in simple administration and high reliability. Additional business continuity functions and the option of expanding your infrastructure with a connection to the cloud.



About SEP

SEP is a manufacturer of backup and disaster recovery software solutions for the protection of all data. The backup solution SEP sesam is developed "Made in Germany" and supports a variety of virtual environments, operating systems, applications and databases - from development to support without backdoors. The universal support of complex system environments clearly sets SEP sesam apart from its competitors. Users appreciate the ability to consolidate multiple backup systems in just one centrally managed solution. The immutable solutions, which provide unalterable protection for backup data even against ransomware, also contribute to additional security. With the SEP Cloud Application Protection Service (CAPS), SEP also offers a GDPR-compliant cloud-to-cloud backup and data loss prevention solution for Microsoft 365, Salesforce, Google Workspace and Dynamics 365.

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