

USING SEAGATE STORAGE WITH VEEAM BACKUP

Implementing Veeam Backup and Replication
with Seagate Exos X iSCSI SAN Storage

veeam

Technology Alliance Partner

Access



CONTENTS

3	INTRODUCTION
3	VEEAM READY-REPOSITORY
4	OVERVIEW OF VEEAM
8	THE SEAGATE EXOS X STORAGE SYSTEM
10	SUPPORTED SEAGATE HARDWARE
10	SIZING THE BACKUP REPOSITORY SERVER
11	EXOS X SYSTEMS
13	REFERENCES

Introduction

Seagate® is a worldwide leader in data storage products and Veeam® is a leader in backup software and data protection. Seagate and Veeam have teamed up to create world-class data storage solutions for the Veeam Backup Repository.

Summary

The Veeam Backup and Replication software suite is made up of several individual component services. The component responsible for storing local backup data is called the Backup Repository.

This document provides a detailed overview of how Seagate Exos® X and Exos E series storage systems integrate with the Veeam Backup Repository.

Recommended Audience

This document is intended for backup and storage administrators, as well as technical sales and support professionals, who are looking to gain a better understanding of how Seagate RAID products are used with the Veeam Backup Repository.

Veeam Ready – Repository

As a Veeam Alliance Partner, Seagate has tested the Exos X series of iSCSI RAID storage systems for inclusion in the Veeam Ready Program.



Overview of Veeam

The Veeam Backup and Recovery software suite includes a variety of mandatory and optional software components. These software components can be run together on a single server or across multiple servers in larger-scale implementations.

Of the three mandatory components, Seagate directly integrates with the Backup Repository as direct-attached storage (DAS) or storage area network (SAN) storage.

- **Backup Server:** The Veeam Backup Server is the component responsible for orchestrating and controlling the backup operations.
- **Backup Proxy:** Veeam Backup Proxies provide application awareness and integration to enable backups of third-party hypervisors, database applications, and other backup sources.
- **Backup Repository:** The Veeam Backup Repository component writes the backup data to a backup target, such as tape, local disk, network storage, and object storage. Seagate Exos X arrays are used directly with the Backup Repository as DAS or SAN storage.

Veeam Backup & Replication Components Overview

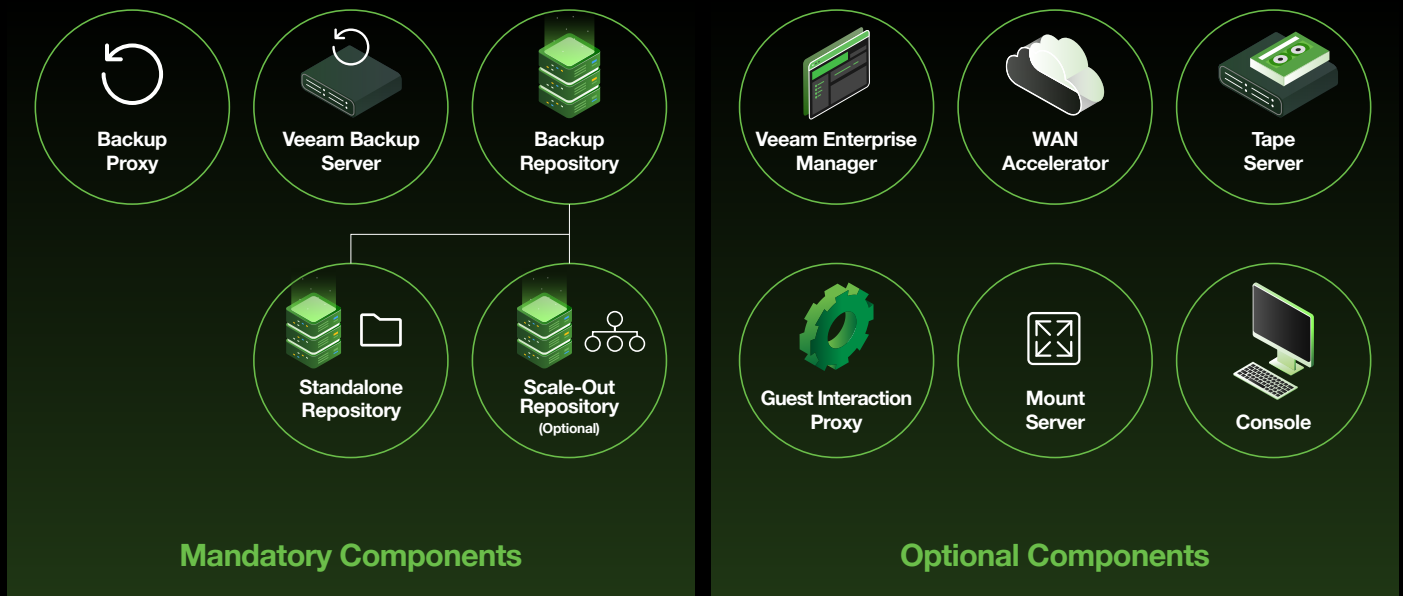


Figure 1

The Veeam Standalone Backup Repository

The Backup Repository Server is responsible for storing and managing the Veeam backup data. It runs on the Windows Server operating system and can write its proprietary backup data to a variety of storage targets. A Standalone Repository uses DAS as a backup target. The DAS can be anything that is recognized by the operating system as a local disk. Examples include an internal hard drive or a logical volume presented by a SAN. SANs can present virtual volumes via iSCSI or Fibre Channel. The iSCSI protocol is more flexible and easier to implement and manage with virtual machines.

The ideal storage target should be:

- High performance
- Usable with virtual machines
- Provide easy provisioning of new volumes to the Veeam server
- Easy to expand and manage

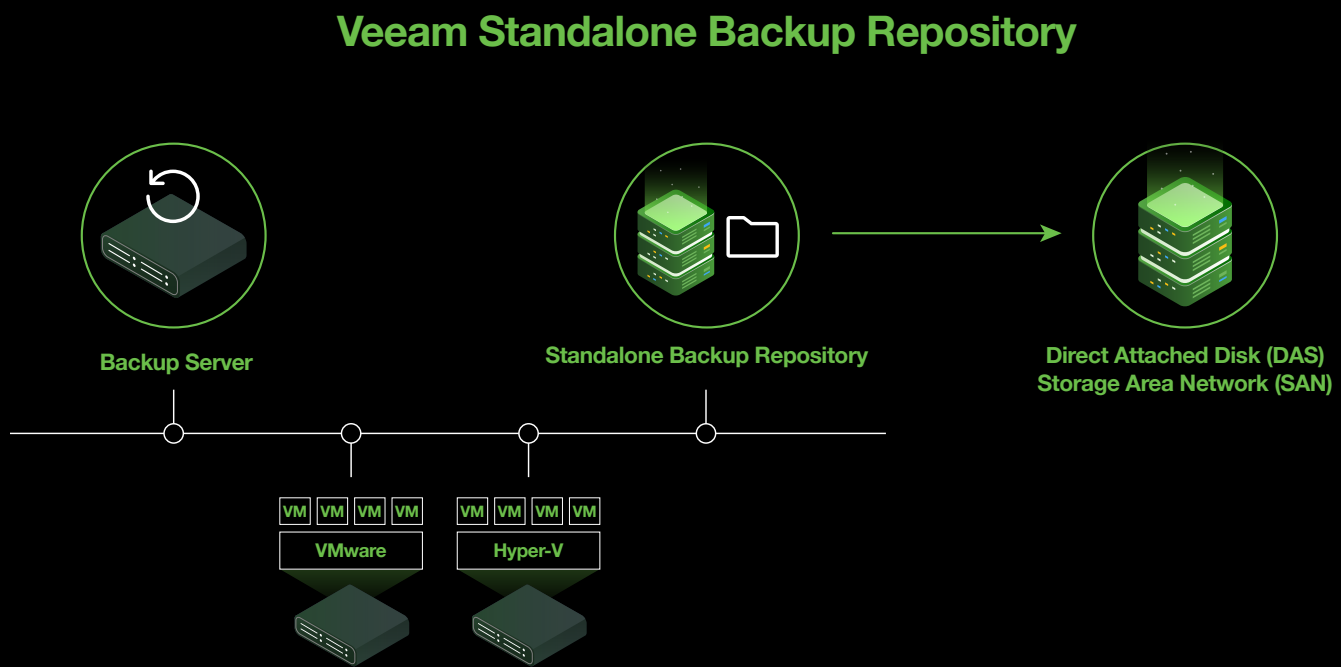


Figure 2

Scale-Out Backup Repository

Veeam Backup and Recovery has an ability to send backup data to targets beyond just DAS. It can be scaled out to write to a variety of network targets. When more than one type of backup target is used with a Repository Server, it is known as a Scale-Out Backup Repository. The Scale-Out Backup Repository consists of a performance tier and a capacity tier. The performance tier is used for frequently accessed local backup storage and can be implemented as any of the storage categories used in the Backup Repository, including DAS or SAN storage. The capacity tier uses S3 object storage to store less frequently accessed backup data in either on-premises or public-cloud-based object storage.

Seagate Exos AP series storage systems, which combine integrated servers with JBOD disk arrays, can be used to implement object-based software-defined storage for secondary backup storage. An example of secondary backup storage is an S3-compatible, object storage target.

Examples of on-premises S3-compatible object storage that can work with the Veeam Backup Repository are:

- Red Hat CEPH
- Cloudian
- MinIO
- Seagate CORTX

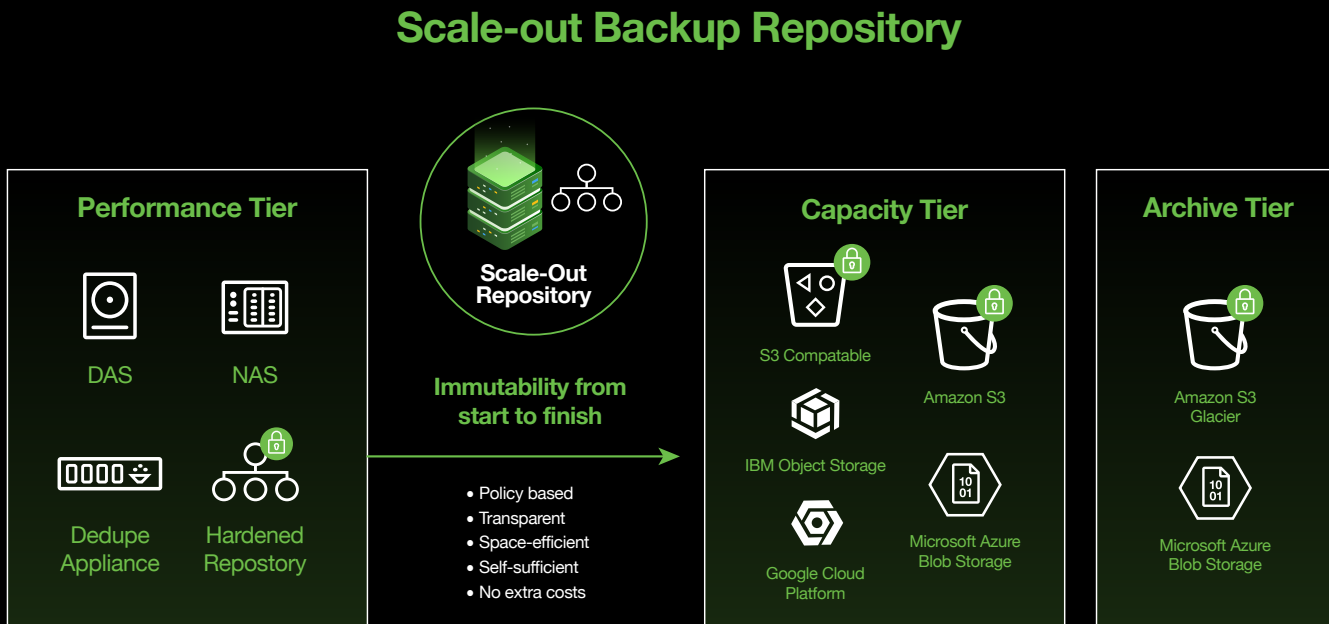


Figure 3

The 3-2-1 Rule Using Veeam Replication and Object Storage

The United States Computer Emergency Readiness Team (US-CERT) put forth recommendations that all computer users, “from home users to professional information security officers,” should follow to protect critical data. These recommendations are referred to as the 3-2-1 rule, and the document describing the rule can be found here:

https://us-cert.cisa.gov/sites/default/files/publications/data_backup_options.pdf

Veeam also recommends following the 3-2-1 rule as a best practice. US-CERT defines the rule as follows:

3. Keep three copies of any important file: one primary and two backups.
2. Keep the files on two different media types to protect against different types of hazards.
1. Store one copy offsite (e.g., outside your home or business facility).

Veeam also recommends that immutable storage be used to protect one or more copies of the backup data from ransomware attacks where the data is encrypted. Immutable storage is defined as storage where the data cannot be deleted or changed during the protection period. Veeam supports two methods of implementing immutable storage: object storage which supports immutability or the hardened Linux repository. The hardened Linux repository is a new feature of Veeam Backup and Replication version 11 which allows an immutable copy of the backup data to be stored on premise. The hardened Linux repository is implemented using a server running Linux where the Linux XFS file system is used to enable the data immutability. The hardened Linux repository storage can be either direct attached or using SAN storage such as a dedicated Seagate Exos X SAN storage array. For more information on implementing a hardened Linux repository, see <https://www.veeam.com/blog/v11-immutable-backup-storage.html>

The Veeam Backup and Replication software suite offers features that enable site-to-site replication and direct copies of backup data to object storage targets. Seagate Exos storage systems can be used in all these cases.

Veeam Replication Between Sites with Object Storage

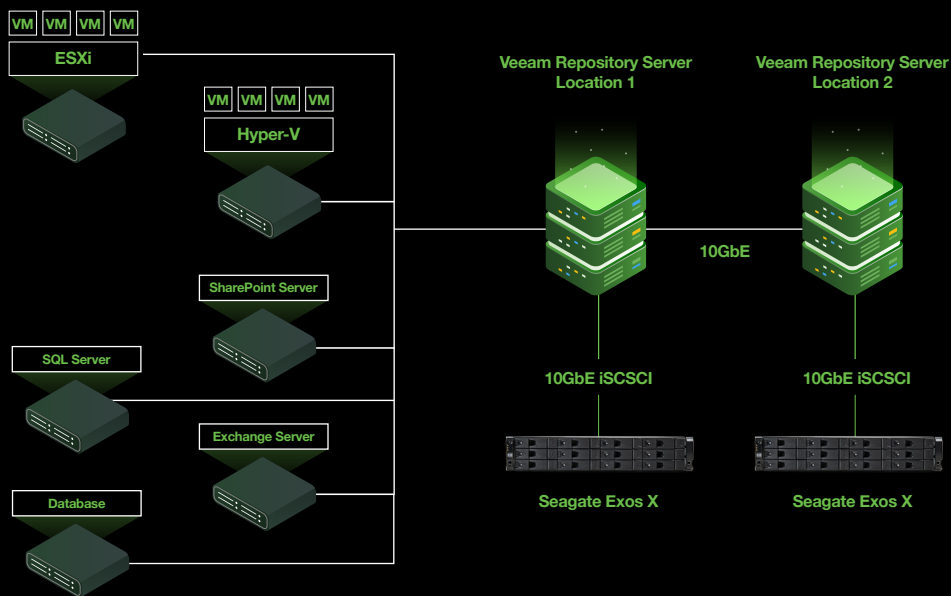


Figure 4

The Seagate Exos X Storage System

Seagate Exos X arrays are high-performance, dual-controller storage arrays. They are available with 10 GbE controllers for iSCSI connectivity and support Microsoft Windows MPIO. Seagate controllers provide data protection through RAID5, RAID6, or Seagate ADAPT (distributed RAID).

Storage Networking Features

iSCSI

Seagate controllers support 10GbE iSCSI, which is ideal for use when the backup servers and the systems that they back up are virtual machines. Most modern operating systems include a software-based iSCSI initiator that is built in.

MPIO

Multipath I/O (MPIO) is a load balancing and failover framework that is required for path management when there are multiple network paths to the same storage device. It is an optional feature in Windows Server. Seagate Exos X storage systems include dual storage controllers with multiple network ports and support for MPIO.

Data Protection with RAID and ADAPT

While Veeam and multiple copies of the data help protect against data loss, a level of protection for the backup data itself is still required. This will ultimately span multiple disk drives that make up the Veeam Backup Repository storage target. There are several data protection options available in the Exos X storage controllers, two of which stand out as best options for use with the Veeam Backup Repository. Both RAID6 and Seagate ADAPT allow for up to a two-disk failure while offering similar levels of performance.

ADAPT and RAID6

While RAID6 and Seagate ADAPT offer similar levels of data protection, they accomplish this in different ways. RAID6 is a traditional RAID configuration in which the data is striped across a minimum of two disk drives and two parity drives.

Seagate ADAPT is a RAID-based level of data protection that maximizes flexibility, provides built-in spare capacity, and allows for fast rebuilds, large storage pools, and simplified expansion.

ADAPT disk groups use all available space to maintain fault tolerance, and data is spread evenly across all the disks.

ADAPT offers several advantages over RAID6, including:

- Significantly faster rebuild times
- The ability to use up to 128 drives compared to RAID6's limit of 16
- Easier expansions with up to 68 disks at a time versus RAID6's limit of one to four disks at a time
- Built-in spare capacity that eliminates the need for spare disks

When new data or new disks are added, or the system recognizes that data is not distributed across disks in a balanced way, it will move the data to maintain balance across the disk group.

Because disk space that is dedicated to sparing is spread across all disks in the system, spare capacity for ADAPT disk groups is automatically reserved. In the case of a disk failure, data will be moved to many disks in the disk group, allowing for quick rebuilds and minimal disruption to input/output (I/O).

Easy Setup and Management

In addition to a full-featured Command Line Interface (CLI), Seagate Exos X storage controllers include the Seagate Storage Management Console. This is a web-based GUI that is easy to access and use. With the management console, administrators can easily provision storage to the Veeam Backup Repository and expand existing volumes as storage needs grow.

Optimize ADAPT for Maximum Throughput

Seagate Exos X systems come with dual controllers that can be optimized for maximum data throughput. ADAPT disk groups can be associated with one controller or the other. Virtual volumes are then provisioned to the Veeam Backup Repository Server through separate controllers to balance the load.

Supported Seagate Hardware

The following Seagate hardware was tested for the Veeam Ready submission and knowledge base article:

- Seagate Exos X 2U12 with 12 12TB HDDs and Exos 3005 controllers
- Configuration: RAID6 (8+2) with two spares and 128K chunk size

Additionally, all models and configurations of the Exos X series with specifications equivalent to or greater than what is listed above are included with the qualification. This means the following systems are also supported:

- Exos X 2U12 enclosure with 3005/4005/5005 iSCSI RAID controllers
- Exos X 2U24 enclosure with 3005/4005/5005 iSCSI RAID controllers
- Exos X 5U84 enclosure with 4005/5005 iSCSI RAID controllers

Note: Minimum configuration RAID6 (8+2) or Seagate ADAPT (requires 12 disks)

Compatible systems are listed in the Veeam Ready database, which can be accessed directly through this link:

<https://www.veeam.com/ready.html>

Additional information about Seagate Systems can be accessed directly using this link <https://www.veeam.com/sys232>



Expansion Units

Seagate Exos X systems can be expanded by adding Seagate Exos E series JBOD enclosures.

- Exos E 2U12 enclosure with 12Gb/s SAS JBOD controllers
- Exos E 2U24 enclosure with 12Gb/s SAS JBOD controllers
- Exos E 5U84 enclosure with 12Gb/s SAS JBOD controllers

Seagate Exos X System Expanded with Exos E Systems

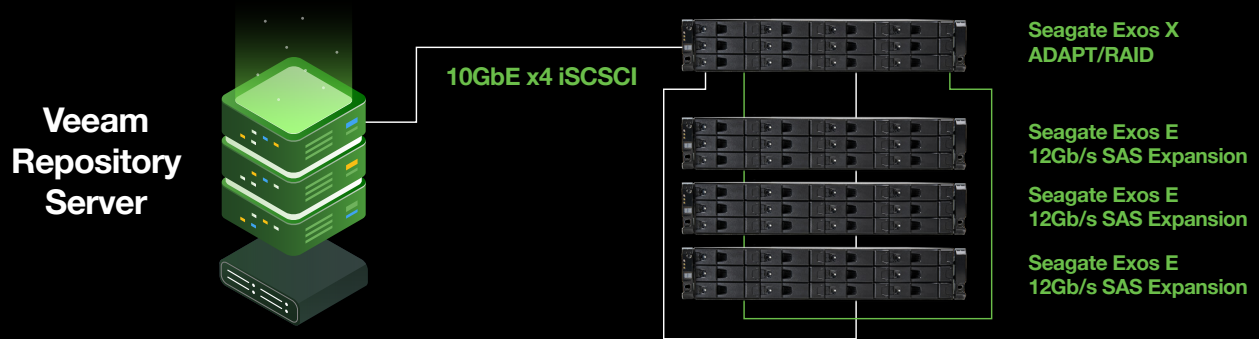


Figure 6

Exos X Systems

Seagate Exos X family of systems:

Exos X 2U12

The Seagate 2U12 platform is ideal for smaller-scale storage that can be expanded as needs grow. Each 2U12 enclosure holds 12 3.5" Seagate HDDs and fits in a 2U rack space.



Figure 7: Seagate Exos X 2U12 Front



Figure 8: Seagate Exos X 2U12 Rear

Exos E 2U12

The Seagate Exos E 2U12 is a 12Gb/s SAS expansion system. Each 2U12 enclosure holds 12 3.5" Seagate HDDs and fits in a 2U rack space.



Figure 9: Seagate Exos E 2U12 Front



Figure 10: Seagate Exos E 2U12 Rear

Exos X 2U24

The Seagate 2U24 platform is ideal for high-density requirements or where SSD is used. Each 2U24 enclosure holds 24 2.5" Seagate HDDs or SSDs and fits in a 2U rack space.



Figure 11: Seagate Exos X 2U24 Front



Figure 12: Seagate Exos X 2U24 Rear

Exos E 2U24

The Seagate Exos E 2U24 is a 12Gb/s SAS expansion system. Each 2U24 enclosure holds 12 3.5" Seagate HDDs and fits in a 2U rack space.



Figure 13: Seagate Exos E 2U12 Front



Figure 14: Seagate Exos E 2U12 Rear

Exos X 5U84

The Seagate Exos X 5U84 platform is ideal for larger-scale storage needs. Each 2U12 enclosure holds 84 3.5" Seagate HDDs and fits in a 5U rack space.



Figure 15: Seagate Exos X 5U84 Front



Figure 16: Seagate Exos X 5U84 Rear

Exos E 5U84

The Seagate Exos E 5U84 is a 12Gb/s SAS expansion system. Each 2U12 enclosure holds 84 3.5" Seagate HDDs and fits in a 5U rack space.



Figure 17: Seagate Exos E 5U84 Front



Figure 18: Seagate Exos E 5U84 Rear

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- Veeam Backup & Replication Best Practices
<https://bp.veeam.com/vbr/>

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