IMPROVE DATA EFFICIENCY FOR RED HAT STORAGE WITH PERMABIT ALBIREO VDO

TECHNOLOGY BRIEF

CLOUD EFFICIENCY COMES IN FOUR KEY TECHNOLOGIES:

- Virtualization
- Open source software
- White box hardware
- Data reduction

VIEW THE INFOGRAPHIC

INTRODUCTION

As datacenter managers consider migrating their unstructured and semistructured data from expensive legacy storage environments to open, scale-out infrastructure, increasing storage density is a key consideration.

Red Hat offers several storage solutions to help organizations cost-effectively store their data. Red Hat® Ceph Storage provides a scalable object store for private cloud environments, and Red Hat Gluster Storage offers an alternative to traditional, scale-out network-attached storage (NAS) appliances.

To complement this new storage infrastructure, organizations use data reduction technologies, such as deduplication and compression, to further reduce the amount of storage hosted in their datacenters. As a result, they can reduce their datacenters' footprints—and costs. Permabit Technology Corporation, a Red Hat technology partner, offers Permabit Albireo Virtual Data Optimizer (VDO) to help organizations increase the data density of their Red Hat Ceph Storage and Red Hat Gluster Storage environments.

BUILDING ON THE BENEFITS OF OPEN SOURCE STORAGE

Many enterprise IT environments lack the physical space and financial resources—as much as US$3,000 per square foot—to expand their data storage. As a result, organizations are seeking cloud-based storage solutions to reduce their datacenter footprints and data storage costs. Open source software solutions help organizations avoid the cost of proprietary storage options, as well as the need for increased physical capacity, by hosting data in public, private, or hybrid cloud environments.

According to a survey by Black Duck Software, 65% of enterprises actively use open source software in their environments—a 5% increase since 2015. In addition, 90% of respondents indicated that open source software improves efficiency, interoperability, and innovation.[1] However, despite the increased efficiency and cost savings from migrating to an open, software-defined storage infrastructure, organizations still seek greater data capacity in less physical space, lower power and cooling costs, and lower hardware expenses.

PERMABIT ALBIREO WITH RED HAT STORAGE

As datacenters scale to petabytes in size, organizations often struggle to expand existing storage space without costly facility expansion. Permabit Albireo VDO delivers block-level deduplication, compression, and thin provisioning to Red Hat Storage environments.

1 *Black Duck Software, The Tenth Annual Future of Open Source Survey, 2016.* blackducksoftware.com/future-of-open-source

RED HAT CEPH STORAGE

Red Hat Ceph Storage is a massively scalable, open source, software-defined storage solution that provides unified storage for cloud environments. By offering object and block storage in one platform, Red Hat Ceph Storage efficiently, automatically manages petabytes of data to support organizations' massive growth. This software-defined storage platform scales across physical, virtual, and cloud resources to provide capacity as needed, without affecting performance. With Red Hat Ceph Storage, organizations can easily and cost-effectively manage storage requirements. As a result, IT teams can focus on meeting business needs rather than building and maintaining underlying IT infrastructure.

In addition, replacing costly, proprietary solutions with Red Hat Ceph Storage eliminates restrictive software vendor lock-in. Red Hat's engineering staff work with the global open source community to develop new features, then include those features in enterprise-ready, predictable, and stable releases.

As organizations consider adopting Red Hat Ceph Storage, they may also consider replacing their traditional enterprise NAS or storage area network (SAN) solutions from proprietary vendors. These solutions offer built-in data reduction that can somewhat offset their higher raw cost per GB. However, Permabit VDO offers advanced data reduction capabilities for Red Hat Ceph Storage—without additional hardware space or costs.

RED HAT GLUSTER STORAGE

Red Hat Gluster Storage provides open, software-defined file storage for standard x86 server platforms as a cost-effective alternative to traditional NAS appliances for unstructured and semistructured data. According to IDC, migrating from a competitive NAS storage system to Red Hat Gluster Storage offers cost savings of 40%.[2]

This offering unifies isolated, fragmented storage with global data access through multiple file and object protocols, as well as scales compute, I/O bandwidth, or storage as capacity and performance needs change. Red Hat Gluster Storage can be deployed on-premise as well as in public and hybrid cloud environments.

As customers migrate workloads from existing proprietary solutions to this cost-effective, open source platform, they can often further reduce their datacenter footprint and costs with Permabit VDO data reduction software.

PERMABIT ALBIREO VIRTUAL DATA OPTIMIZER (VDO)

Permabit Albireo VDO reduces datacenter footprints with data deduplication and compression for Linux®-based environments, minimizing the server load and storage arrays needed.

2 *IDC, "The Economics of Software-Defined Storage", Sept 2016.* redhat.com/en/resources/economics-of-software-defined-storage-idc-whitepaper

Learn more about Permabit Albireo VDO at permabit.com/products-overview/albireo-virtual-data-optimizer-vdo/

Learn more about Red Hat Storage at https://www.redhat.com/en/technologies/storage

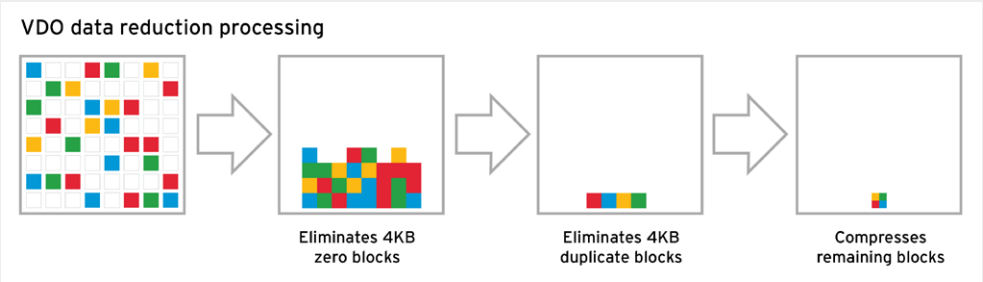


Figure 1. Permabit Albireo VDO data reduction process

By combining these techniques, Permabit Albireo VDO lowers the acquisition cost for hybrid cloud storage by requiring smaller initial purchases. In addition, Permabit Albireo VDO requires fewer servers and disks than hardware-based solutions, reducing power and cooling costs to lower operational expenses (OpEx). As a result, Permabit Albireo VDO achieves double the density for archive repositories using object or file storage and six times greater density for virtual server environments on block storage. To help organizations predict their potential data reduction, Permabit offers a non-intrusive, read-only data deduplication and compression analytics tool.

Permabit Albireo VDO for OEM exists as a Linux device mapper module in the kernel (Figure 2) but does not require Linux kernel rebuilds when a new version of Linux is deployed, simplifying maintenance.

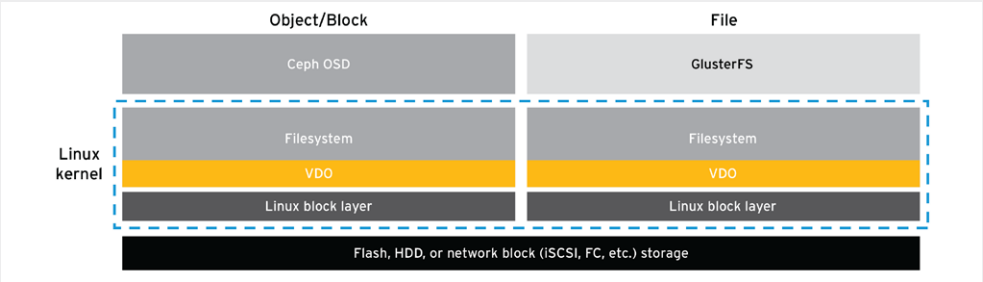


Figure 2. Permabit VDO for Linux-based environments

With Permabit Albireo VDO for OEM, IT organizations gain:

- 4KB inline deduplication for maximum efficiency.
- Deduplication-aware compression for maximum performance.
- Optimized flash and hard disk drive (HDD) storage in hybrid cloud environments.
- Thin provisioning for inline zero elimination and oversubscription at 4KB granularity.
- Low performance impact – typically less than 20%.

Permabit has designed Albireo VDO for Hybrid Cloud with enhanced data storage on Red Hat Enterprise Linux so its storage advantages can reach Linux users through a market leader.[3] Permabit has performed extensive testing for this standalone offering to ensure maximum performance and efficiency with Red Hat Gluster Storage and Red Hat Ceph Storage.

USE CASES

CEPH STORAGE

According to a 2016 survey, OpenStack® users prefer Ceph storage over other storage solutions by more than a two-to-one margin.[4] A common OpenStack workload is the orchestration and storage of virtual disk (vDisk) images. Using Permabit Albireo VDO for effective deduplication of these images often helps users achieve a six times reduction in their storage footprint for block-based virtual server environments, compared to physical, hardware-based options.

Object stores, such as Red Hat Ceph Storage, are particularly effective for archives. Ceph is also commonly used for long-term, growing repositories of unstructured data. Although video file archives are often already compressed—and therefore may not greatly reduce in size—other types of data, such as scientific research, seismic data from the oil and gas industry, and uncompressed medical images may experience greater storage benefits from Permabit Albireo VDO.

GLUSTER STORAGE

Traditional file use cases—such as general purpose file serving and home directories—are a common Red Hat Gluster Storage data reduction use case for Permabit Albireo VDO. Customers often replace traditional NAS file servers with Red Hat Gluster Storage on standard x86 servers for a low-cost NAS archive or backup. In addition, adding Permabit Albireo VDO inline data compression and deduplication to active archive use cases can further reduce costs.

CONCLUSION

Data reduction using Permabit Albireo VDO helps organizations maximize data storage density and achieve lower total cost of ownership (TCO) for Red Hat Storage hybrid cloud and scale-out file share environments. By combining these Permabit and Red Hat technologies, IT can increase data efficiency by reducing storage resource use, avoiding datacenter expansion, and reducing standard server load for scale-out cluster deployments. As a result, organizations can focus IT resources on meeting business needs instead of expanding and maintaining proprietary, costly physical storage infrastructure.

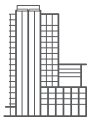
ABOUT PERMABIT

Permabit pioneers the development of data reduction software that provides data deduplication, compression, and thin provisioning. Its innovative products enable customers to get to market quickly with solutions that cut effective cost, accelerate performance, and gain a competitive advantage. Just as server virtualization revolutionized the economics of compute, Permabit software is transforming the economics of storage today.

Permabit is headquartered in Cambridge, Massachusetts, with operations in California, Korea, and Japan. For more information, visit permabit.com.

3 redhat.com/en/technologies/linux-platforms/enterprise-linux

4 *OpenStack User Survey, April 2016*. https://www.openstack.org/user-survey/survey-2016/landing?BackURL=/user-survey/survey-2016/



ABOUT RED HAT

Red Hat is the world's leading provider of open source software solutions, using a community-powered approach to provide reliable and high-performing cloud, Linux, middleware, storage, and virtualization technologies. Red Hat also offers award-winning support, training, and consulting services. As a connective hub in a global network of enterprises, partners, and open source communities, Red Hat helps create relevant, innovative technologies that liberate resources for growth and prepare customers for the future of IT.

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