

Complete Storage and Data Protection Architecture for VMware vSphere

veeam



Executive Summary

The cost savings and agility benefits of server virtualization are well proven, accounting for its rapid adoption. Not only does virtualization reduce the number of physical servers IT needs to provision and maintain, but equally compelling, virtualization transforms the data protection paradigm. Now businesses can recover from failures in minutes, not hours, with unprecedented affordability. Key to achieving the best business uptime and cost savings is the storage management and data protection design.

In this paper, Hewlett-Packard and Veeam Software outline an end-to-end storage and data protection architecture optimized for VMware vSphere™. Core components of the architecture are HP P4000 SAN storage, the HP D2D StoreOnce backup system and Veeam Backup & Replication.

Key points:

- The HP P4000 provides VMware optimized shared storage.
- Data deduplication in the HP D2D StoreOnce backup system optimizes backup data storage.
- Veeam Backup & Replication Instant VM Recovery and incremental backups enable enhanced recovery time objectives (RTOs) and multiple recovery points for world-class service levels.
- The entire solution offers compelling total cost of ownership (TCO)—breakeven in months, not years.
- This certified solution is fully supported by HP and Veeam.

IT is a complex business, and successful vendors make it simple for their customers. HP and Veeam have collaborated to fully co-certify their best-of-breed solutions, ensuring customers can deploy them with ease and with total confidence. The HP and Veeam storage and data protection solution for VMware vSphere described in this document is proven, provides unprecedented data protection and is affordable for even the smallest environments.

Primary Storage in Virtual Infrastructures

Virtualization offers business agility through the ability to easily provision new virtual machines (VMs) and optimize the allocation of available physical resources to VMs to meet user and application requirements. The primary storage requirements differ from traditional storage deployments. HP P4000 SAN storage is designed for the specialized requirements of virtual environments.

The HP P4000 provides multiple layers of data availability with component redundancy, RAID, snapshots and replication. Just like any dual redundant storage system, the HP P4000 is designed to sustain disk and other component failures so data remains available to applications in these scenarios. However, the HP P4000 takes data availability to the next level.



HP P4000 SAN Storage

With a groundbreaking new scale-out architecture and a feature called Network RAID, the HP P4000 keeps data online even during power outages, site disasters

HP P4000 SAN storage is optimized for virtual environments

and—most importantly—human errors. How? The HP P4000 can distribute two, three and even four copies of the data across different storage nodes installed in different locations. This means that if a double disk failure occurs, an IT administrator accidentally takes a node offline, or a rack's power is shut off, a copy of those blocks is available in a different storage node. Applications never lose the ability to read or write and continue working with no impact to users.

Disk-to-Disk Backup Storage

The HP D2D StoreOnce backup system typically reduces backup storage requirements by 95%

Disk-based backup solutions are increasingly used because disk offers several advantages over tape as the primary backup medium. This trend in backup is occurring at the same time as a fundamental shift in datacenter architecture as a result of the rapid adoption of server virtualization. Disk is online so data recovery starts fast, and it also enables services such as backup data deduplication and replication.



HP D2D StoreOnce Backup System

HP StoreOnce, created by HP Labs, is HP's inline deduplication solution. It eliminates duplicate data to reduce the amount of backup data stored on disk, usually by 95%. By using the smallest segment size in the industry to identify repeated data, The HP D2D StoreOnce backup system can deliver the highest deduplication ratios. This delivers a compelling TCO for IT users. Customers can now affordably store their backup copies of information on highly reliable HP D2D StoreOnce backup systems.

Virtualized environments are ideal for backup deduplication solutions. Virtual machine images are typically large, with a high degree of commonality among images. Instead of physically storing the backup of each VM, HP StoreOnce intelligently divides each backup into segments and only stores the unique segments, replacing repeated segments with much smaller logical pointers to the stored segment. This elimination of redundant data is similar to the business justification of virtualization itself—higher efficiency and utilization of IT assets.

Backup and Recovery

Veeam Backup restores an entire VM in minutes by running it directly from the compressed and deduplicated backup file

Veeam Backup & Replication was designed from the ground up specifically for virtualization. Without the legacy of physical machine backup to tape, it is able to offer features tuned to VMware protection and leverage the advantages of disk as a backup target. For the first time, you can automatically verify the recoverability of every backup, restart a VM directly from a backup file, and restore individual files, application objects, or all or part of a VM from the same image-level backup without any agent software running in the VM.

With new vPower technology, Veeam makes it possible to run a VM directly from a compressed and deduplicated backup file. There's no need to provision storage or extract the backup—you simply run the VM directly from the backup file on the HP D2D StoreOnce backup system. The backup is not altered; instead, it is made available as read only with any changes stored in a separate location.

You can also automatically verify the recoverability of backups and instantly retrieve individual application items—from any virtualized application, and without agents or special backups. And when you need to recover a VM in the production environment, you can do that, too. Just run the VM from the backup

to restore service to users in just a few minutes. To complete the recovery, use Storage vMotion™ to move the VM to a datastore on the HP P4000 with no disruption to users. If you don't have Storage vMotion, simply replicate or copy the VM to the HP P4000 using these built-in capabilities in Veeam Backup & Replication.

The same vPower technology can be used to create an on-demand sandbox for testing, training or troubleshooting. Just power on the required VMs to the desired restore point (full or incremental). It is a great way to put your backups to work and get additional value from the HP D2D StoreOnce backup system.

Data Protection and Storage Architecture

Combining HP P4000 SAN storage, the HP D2D StoreOnce backup system and Veeam Backup & Replication, IT users benefit from higher performance and availability of their VMware vSphere environment. What this means in practice is robust primary storage, high efficiency deduplicating and replicating disk backup storage, and powerful, easy-to-manage data protection software.

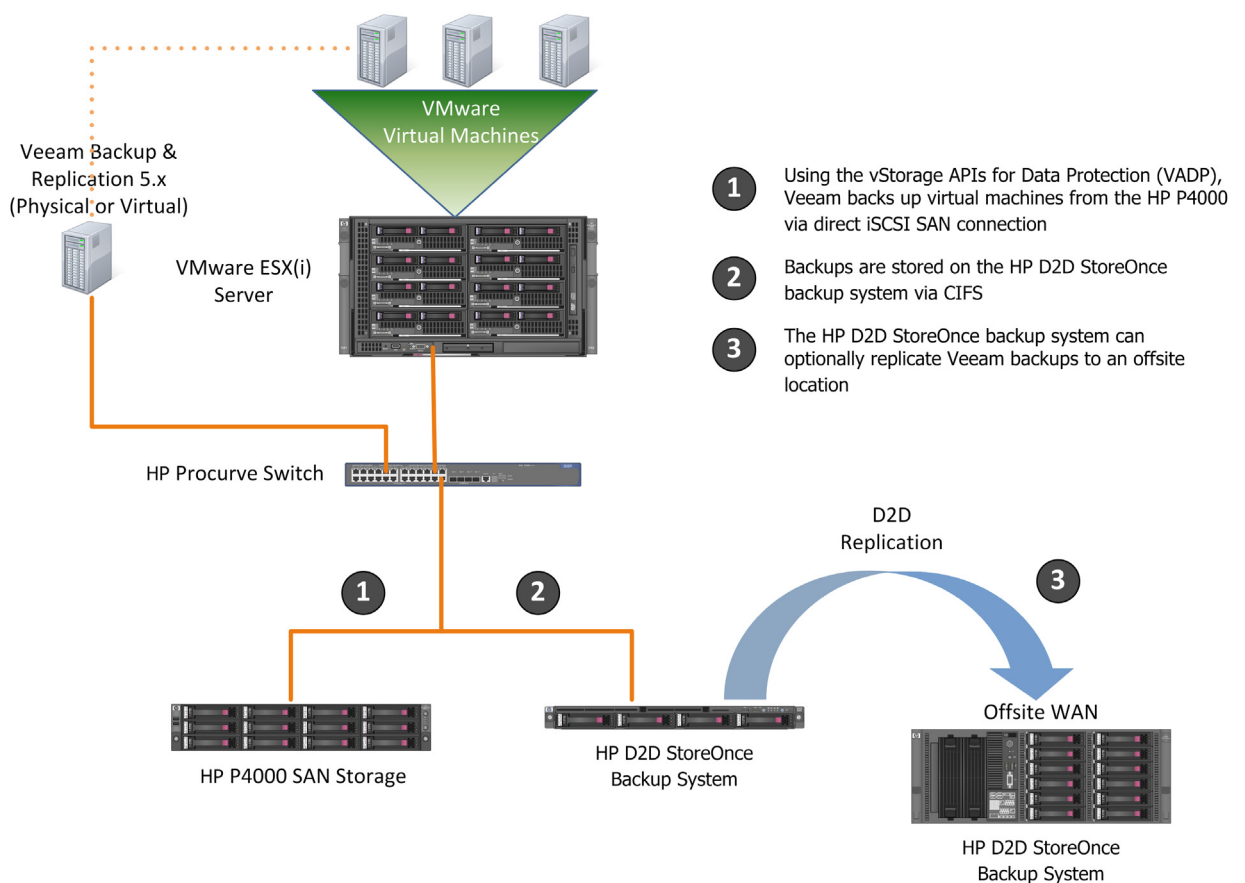


Figure 1 Storage and Data Protection Architecture

Benefit 1: HP P4000 SAN storage offers tight integration with VMware vSphere along with performance and high availability through component redundancies and Network RAID.

Benefit 2: Combining Veeam deduplication and HP StoreOnce deduplication enables backup load on the network to be reduced, more recovery points to be stored on disk and faster recovery times.

Benefit 3: Veeam Backup automates the recovery verification process without affecting the backup window by creating a VM in an isolated environment and running it directly from the backup file. It starts the VM, boots the OS and confirms that applications inside the VM are running normally. IT rests easy knowing that backups actually do work—every backup, of every VM, every time.

Benefit 4: Single files or groups of files can be identified and quickly recovered directly from the HP D2D StoreOnce backup system.

Benefit 5: Should an entire production VM fail, the IT administrator can immediately restart the VM from the compressed and deduplicated backup file on the HP D2D StoreOnce backup system so the VM is accessible while the problem is resolved or full recovery executed.

Benefit 6: For disaster recovery protection, the HP D2D StoreOnce backup system can replicate Veeam Backup files offsite to a second HP D2D StoreOnce backup system.

The Bottom Line

The HP and Veeam end-to-end storage and data protection architecture described offers storage efficiency and breakthrough recovery time and recovery point objectives (RTOs and RPOs). Users are up and running in minutes after a VM fails.

But what about price?

The end-to-end architecture is surprisingly affordable. Consider the following proofpoints:

- Veeam Backup is licensed per processor on the ESX(i) host for predictability and affordability.
- HP customer studies have shown the HP D2D StoreOnce backup system generates 50% TCO savings compared with traditional backup infrastructure—with the additional benefit of faster recovery.
- The HP D2D StoreOnce backup system makes it affordable to keep many recovery points on disk for fast recovery and provides a 40% price/performance advantage over competitive offerings.¹
- Storing backups on HP D2D StoreOnce backup systems and using Veeam Backup result in return on investment (ROI) payback in months, not years, based on downtime avoidance and work elimination.

Customer environments, as well as business and compliance requirements, vary widely. In order for HP and Veeam to develop an ROI calculation customized for you, please contact your local HP Sales Representative or Channel Partner. You will find the results compelling.

¹ Comparison of D2D4324 and DD860 96 TB products using available pricing as of February 2011.