Data Protection Without Limits

By Michael Otey



VEEAM

Hewlett Packard Enterprise

Data Protection Without Limits

By Michael Otey

Always-on is a requirement for most businesses today. In this whitepaper, you'll see how you can use Veeam and HP solutions to meet your availability objectives and future-proof your datacenter. You'll learn about the requirements driving the need for increased availability, as well as the costs of downtime. In addition, you will see how Veeam and HP solutions can enable you to meet your always-on business goals by providing data protection without limits. And you will also see examples of how other organizations have used these technologies to improve their application availability, meet recovery time objectives (RTOs) and recovery point objectives (RPOs), and provide fast, reliable disaster recovery capabilities.

Always-On Business

Globalization has become the norm. The exploding use of mobile devices and the Internet now requires most businesses' websites to be constantly available. Additionally, employees need 24×7 access to corporate resources. These types of requirements drive the need for increased levels of availability and recoverability for your business services. Downtime can be extremely costly. A 2014 Gartner study called "The Cost of Downtime" revealed that the average cost of downtime for businesses was $5,600 per minute, which roughly equates to $300,000 per hour. That particular study was an average across all businesses. For many organizations, it can be much more. For instance, according to a *Forbes* article, a 30-minute outage for Amazon in 2013 cost the company an estimated $3 million in lost revenue.

Loss of revenue and operational capabilities are only part of the costs. Downtime can also result in lost customer confidence, damaged reputation, employee productivity losses, and reduced confidence in IT. Outside of the organization, there might be financial impact to partners. It's important to understand that downtime isn't just the time that a given server is unavailable. True downtime must be counted as the time that users are unable to access the applications and resources they need. The bottom line is that any amount of downtime equals lost business.

There are many causes of downtime. Some are technical, but others are not. Some of the leading causes of downtime are:

- Hardware failure
- Software failure
- Operations errors
- User errors
- Natural disasters

An unfortunate fact in technology is that systems do fail. The modern datacenter and today's IT infrastructure have many components, high demands, and often have significant complexity. To ensure application availability for today's modern datacenter, you need to build in availability technologies including data protection strategies as you build out your infrastructure. In the next section, you'll see how you can take advantage of Veeam and HP solutions to increase your application availability, to meet your backup and restore objectives, and to provide reliable, high-speed disaster recovery capabilities.

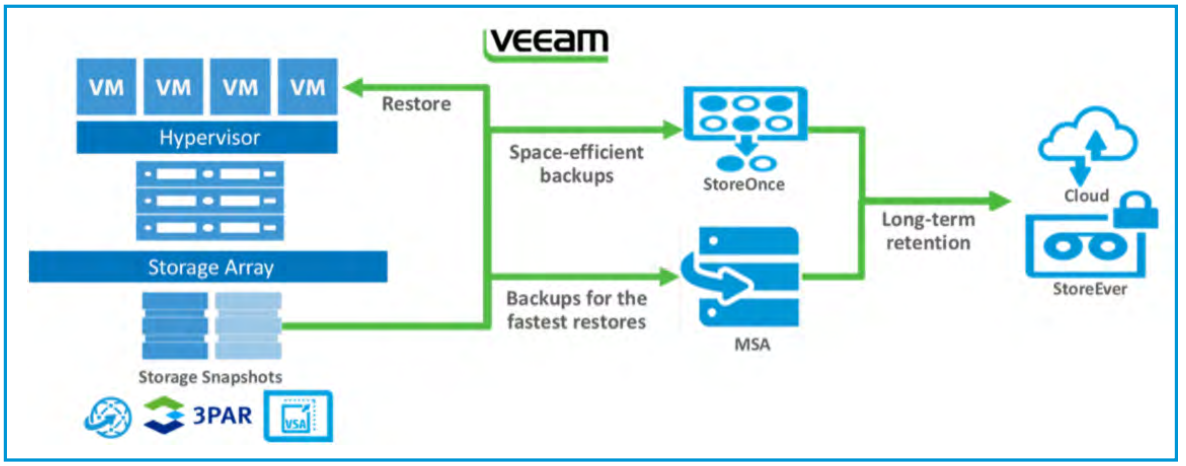
Meeting Your Data Protection Goals

Backup and recovery are at the core of all enterprise data protection strategies. Today's virtual environments present new challenges for protecting and recovering data. Legacy backup tools were built with physical servers in mind, which can cause long backup times, performance constraints and limit their recovery capabilities in a virtual environment. Because of this, many organizations are unable to meet the backup window for their VMs.

One key factor is that legacy backup tools typically rely on agents running inside the VM to accomplish backup and recovery operations. These agents running inside VMs can create resource problems. They use guest CPU cycles and consume network bandwidth and memory. Agents also add to the complexity of maintaining software and increase support costs. Plus, agent-based technology doesn't work at all when VMs are powered off, unavailable, or newly provisioned. Adding further complexity, most organizations are using multiple hypervisors, and in many cases each hypervisor might utilize a different backup solution, resulting in increased management demands.

Veeam uses agentless technology that is hypervisor-agnostic and designed from the ground up to protect VMs. Veeam's integration with HP storage solutions lets you create application-consistent backups from HP StoreServ and StoreVirtual snapshots for fast and efficient data protection. Figure 1 shows an overview of how Veeam can work with HP StoreServ, StoreVirtual, StoreOnce, MSA, and StoreEver technologies to provide a complete data protection strategy.

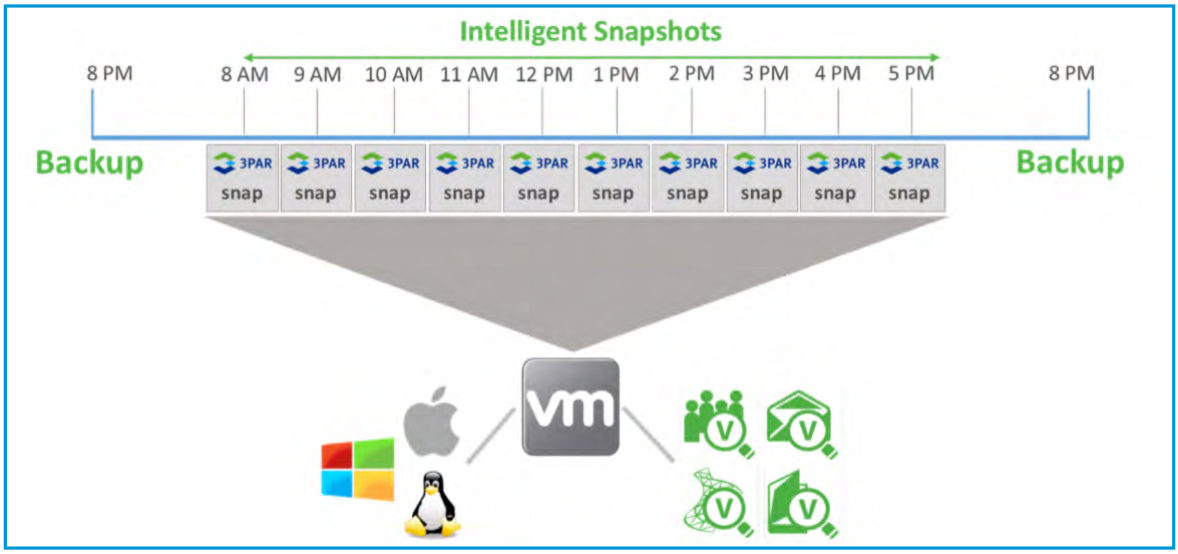
Figure 1: Veeam and HP enable 3-2-1 data protection



In Figure 1 you can see how Veeam combined with HP storage provides a comprehensive strategy for achieving any recovery and retention requirements. HP's MSA provides support for Veeam Instant VM Recovery as well as SureBackup. For long-term external storage, HP StoreOnce provides deduplication for efficient storage utilization and fault isolation for data. Both HP MSA and StoreOnce can copy backups to StoreEver tape storage or to the cloud for long-term off-site data archival. This strategy enables you to meet the 3-2-1 goal of data protection where there are three copies of the data, on two different media types and one copy is kept offsite.

Veeam Backup & Replication in combination with HP StoreOnce provides a highly efficient deduplication solution that can increase a system's backup capacity by almost 95 percent. This allows a greater number of backup images to be stored on disk, providing more recovery points and faster restores from backups. StoreOnce's variable length deduplication provides a fine grained deduplication capability that increases the overall storage efficiency of backups and reduces costs. StoreOnce allows you to deduplicate across Veeam backup jobs further improving deduplication efficiency as well as enabling bandwidth efficient replication of VM backups for cost efficient disaster recovery. StoreOnce is available in multiple form factors including StoreOnce VSA, which is a virtual deduplicating appliance that runs as a VM and can turn any existing infrastructure into a deduplication target. HP 3PAR StoreServ/StoreVirtual storage arrays enable you to take fast, frequent snapshots of your VMware volumes without impacting your production workloads. The 3PAR StoreServ system allows you to take snapshots as frequently as every five minutes, while StoreVirtual allows you to take snapshots every 30 minutes. You can see an example of using Veeam with HP 3PAR StoreServ snapshots in Figure 2.

Figure 2: Using HP 3PAR snapshots with Veeam Backup & Replication



HP 3PAR StoreServ and StoreVirtual snapshots and Veeam radically improve your RPOs by providing multiple up-to-date recovery points. Veeam's integration with StoreServ and StoreVirtual snapshots allows you to recover your VMs and data directly from these frequent snapshots, thus minimizing any possible data loss and ensuring that your data is as up-to-date as possible. Veeam Explorer for Storage Snapshots provides visibility directly into the HP 3PAR StoreServ/StoreVirtual snapshots, enabling granular recovery of entire VMs with Instant VM Recovery or the recovery of individual guest OS files and application items. Veeam Explorer for Storage Snapshots with HP 3PAR StoreServ/StoreVirtual storage can shorten both RPOs and RTOs to less than 15 minutes and enable you to recover data quickly from snapshots that could be just minutes old. This also enables you to implement a near-continuous data protection strategy without additional cost or complexity.

Veeam Backup & Replication also has the ability to back up from storage snapshots where the Veeam backup proxy server can mount storage snapshots directly. This capability enables fast non-disruptive image-level backups by cutting down the need for VMware VM snapshots. This capability, while not new to the industry, is 20 times faster than the competition due to the use of VMware's Changed Block Tracking (CBT). If you have multiple backup proxy servers, Veeam uses automatic load-balancing to choose the backup proxy server that will best execute a VM backup—each time the backup job runs. The automatic load-balancing detects which backup proxy server has a combination of the best datastore connectivity and the lowest current task load. Together, these and other various Veeam technologies can drastically decrease your backup window.

Norwegian Cruise Lines Meets RTOs and RPOs with Veeam and HP

Norwegian Cruise Lines is a leader in adopting technology to run its core travel business. Norwegian Cruise Lines has deployed more than 1,300 VMs to run its critical operations onboard every ship, as well as in its onshore offices. When its legacy backup tools couldn't recover VMs running critical systems fast enough, the company looked to Veeam and HP to provide a better solution for meeting its RTOs and RPOs. The company's legacy backup tools were restricted to infrequent and slow file-level backup to tape. This made recovering VMs time-consuming and resulted in extended RTOs and RPOs. The legacy backup tools also required agents to be installed and managed on each VM, necessitating additional management time and effort, as well as unwanted expenses.

Norwegian Cruise Lines deployed Veeam Backup & Replication in conjunction with HP StoreVirtual and StoreOnce storage solutions. HP StoreOnce is used onshore, and HP StoreVirtual is used on ships to store backups. The combination of Veeam and these HP storage solutions provides Norwegian Cruise Lines with advanced recovery capabilities, enabling the company to meet its objectives. For example, the IT team uses Veeam Explorer for Storage Snapshots to restore VMs and individual items directly from HP StoreVirtual SAN snapshots. The recovery of an entire VM from StoreVirtual snapshots takes only a couple of minutes. Additionally, StoreVirtual snapshots are taken frequently to provide multiple recovery points to meet RPOs. The data deduplication capabilities in Veeam and the HP storage solutions radically reduce the amount of space needed for backup storage.

Michael David Perez, manager of IT infrastructure and operations for Norwegian Cruise Lines, states: "Veeam Backup & Replication meets our RTOs and RPOs and has also helped with business continuity." Perez goes on to say, "Most of the tools couldn't meet all of our requirements. They didn't provide feature-rich functionality like Veeam's Instant VM Recovery, Instant File-Level Recovery, and forever-incremental backup for numerous recovery points. If you're looking for a backup and recovery solution to meet your RTOs and RPOs and help with business continuity, do your research: You'll find that Veeam is your best option." You can learn more about how Norwegian Cruise Lines uses Veeam and HP for data protection in "Norwegian Cruise Line Ensures High Availability on Land and Sea with Veeam."

Increasing Application Availability

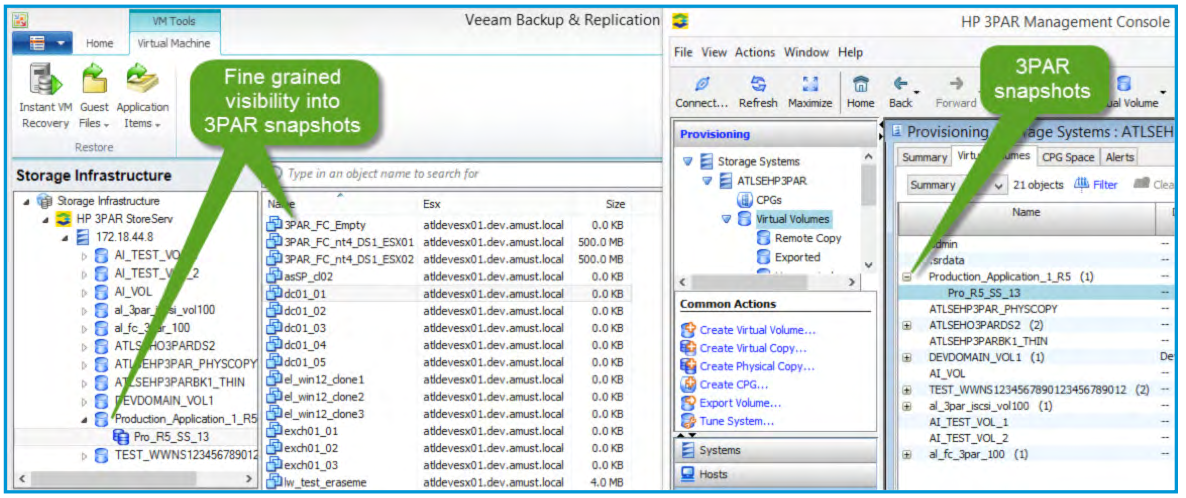
Availability starts with choosing aprimary storage platform that provides the levels of high availability and performance that your business critical applications require. HP's 3PAR StoreServ provides a proven, highly available, Tier-1 architecture that uses a single architecture and OS across midrange, all-flash, and high-end storage arrays. HP 3PAR StoreServ offers the only six-nines (99.9999) guaranteed availability program in the storage market. Using HP's new four-node or larger HP 3PAR StoreServ 10000, 7400, or all-flash 7450 Storage system combined with the best practices outlined in the Get 6-Nines Guarantee Program will provide a storage system with the availability required for your most critical business data. HP 3PAR's Persistent Cache eliminates any performance impacts that might be caused by a node outage. Plus, the HP 3PAR StoreServ eliminates all active single points of failure by using completely redundant components and power paths. Clustering allows each volume to be active on all nodes at all times. For proactive maintenance the HP 3PAR implements a dedicated service processor with phone-home capabilities that can notify you and HP support of system alerts enabling you to address any potential issues or errors. HP 3PAR Virtual Copy Software enables you to take instant point-in-time copies of your data volumes with little or no impact to your applications providing a built-in solution for storage as well as resource efficient, volume-level protection and roll back for data that reside on the 3PAR array.

The tight integration of HP storage solutions and Veeam brings improved business continuity and better application uptime to your environment. Veeam Backup & Replication enables virtual machines (VMs) to be backed up to disk for fast recovery and and copied to low-cost storage media for backup archival. Using Veeam Backup

& Replication in conjunction with HP 3PAR StoreServ or StoreVirtual snapshots lets you recover VMs in minutes using Veeam's Instant VM Recovery from Storage Snapshots. Using Veeam with HP snapshots allows far faster backup and recovery than traditional snapshot technologies. For instance, while hypervisor-based snapshots don't require any special hardware integration with the storage platform, they negatively impact VM and application performance. Likewise, recovery from standard SAN-based snapshots is a time-consuming process requiring multiple manual steps. With volume-level snapshot technology, the snapshot must first be promoted to a volume, then mounted to a host and then the process of recovering the VM or data can begin. Once the recovery is complete, the snapshot mounting process must be undone to clean up. Veeam in combination with HP 3PAR and StoreVirtual snapshots provides intelligence to the storage snapshot allowing for streamlined, efficient, and fast granular recovery of VMs, guest OS files and application items directly from those HP snapshots. The resulting high performance and low overhead of leveraging storage snapshots enables you to create more frequent restore points and increases granular protection. This, in combination with the rapid recovery capabilities, improves your RTPOs.

Veeam's Instant VM Recovery enables you to quickly move a VM from a storage snapshot to production, reducing recovery time and delivering improvement to your application availability. The VM is registered from a storage snapshot, started, and then copied into a production volume. Instant VM Recovery migrates the VM from the storage snapshot to your production environment using the most advanced migration technology available: VMware Storage vMotion, or Veeam Quick Migration. Depending on the situation, the VM recovery can happen in the background with no interruption to end-user services. In most cases, Instant VM Recovery takes less than two minutes. Figure 3 shows an example of initiating Instant VM Recovery using HP 3PAR snapshots.

Figure 3: Running a Recovery using Veeam



The HP 3PAR Management Console is shown on the right side of Figure 3 and the available snapshots are listed under the Virtual Volumes tab. The Veeam management console shown on the left side of the figure lets you easily recover VMs with just a few clicks. In Figure 3, you can see how Veeam is able to intelligently display the contents of the Pro_R5_S3_13 snapshot. To recover a VM or its contents you select the snapshot that you want to use and then select the VM that you want to recover. The context menu provides options for both Instant VM recovery and Restore application items. Instant VM recovery will restore the entire VM and another window will prompt you for recovery point-in-time and destination. The Restore application items option will start one of the Veeam Explorers that are covered in the following section.

Veeam enables you to perform granular restore options from backups or directly from storage snapshots using Veeam Explorers. Veeam Explorers let you browse and search the contents of Veeam backup files, then optionally restore individual files and items. Veeam Availability Suite offers the following Veeam Explorer products:

- Veeam Explorer for Microsoft Active Directory—Search for and restore all Active Directory (AD) object types, including users, groups, computer accounts, and contacts. You can also restore user and computer passwords.
- Veeam Explorer for Microsoft Exchange—View Exchange Server 2010 and 2013 backups. The Explorer provides advanced search capabilities and quick recovery of individual Exchange items, including individual email messages, contacts, and notes.
- Veeam Explorer for Microsoft SQL Server—Accomplish fast transaction-level recovery of SQL Server databases. You can restore your SQL Server databases to a precise point in time using agentless transaction-log backup and replay.
- Veeam Explorer for Microsoft SharePoint—Browse SharePoint 2010 and 2013 backups. You can search for specific SharePoint files and quickly recover items to their original SharePoint server, or you can send them as email attachments.
- Veeam Explorer for Storage Snapshots—Recover single files or entire VMs from HP storage snapshots in two minutes or less, without the need for staging or other intermediate steps.

Vodafone Ensures Application Availability with Veeam and HP StoreVirtual

Vodafone Netherlands operates in a dynamic and competitive environment that requires fast response to their customers' evolving requirements. Vodafone has hundreds of VMs spread across multiple datacenters in the Netherlands. These VMs run Microsoft SQL Server, Oracle, SAP, Zend Server, and a proprietary back-office portal and service navigator. Vodaphone uses HP ProLiant servers and HP StoreVirtual virtual storage appliance (VSA) storage. Vodafone requires 24×7 availability. The company uses Veeam to ensure the high availability of its virtualized applications and data by backing up its VMs from HP StoreVirtual snapshots. Backing up from StoreVirtual snapshots has little to no impact on production VMs. Many Veeam customers take backups from snapshots every 30 minutes to improve their recovery point objectives (RPOs). To meet their recovery time objectives (RTOs) Vodaphone uses Veeam Explorer for Storage Snapshots to recover VMs, files, and application items. Vodafone reduced its backup storage footprint by two and a half times by combining deduplication and data compression in Veeam with deduplication in Windows Server 2012 R2. Veeam Availability Suite provides 80% faster backup and recovery is five times faster than the older legacy backup tool.

Nikola Stojanovski, a technical specialist at Vodafone, explains: "We needed the best data protection for our production environment, and Veeam offers frequent and reliable backup, storage integration, a smaller storage footprint, high-speed recovery, replication for failover, and improved monitoring and reporting. We didn't have to make any hardware investments, and Veeam integrates seamlessly with HP StoreVirtual." To learn more about how Vodafone uses Veeam and HP to meet its application availability requirements click here.

Reliable, Streamlined Disaster Recovery

Disaster recovery is another vital component of an enterprise data protection plan. Businesses need the ability to replicate their data to multiple sites using multiple media types. Those sites might be dedicated disaster recovery sites, other regional offices, or the cloud. Veeam Backup & Replication includes the built-in ability to provide near-continuous data protection (near-CDP) for your VMs, providing offsite data protection for your virtual environment. Veeam's technology lets you maintain image-based replicas either onsite for high availability or offsite for disaster recovery. Veeam's Backup & Replication provides you with a copy of your VMs in a ready-to-start state. If a VM goes down, you can immediately fail over to the replica VM and run it on your main site or from a remote site. Veeam Backup & Replication provides the ability to fail over and fail back. It can synchronize data changes between the replica and the primary VM, and it can perform automated IP readdressing to accommodate different networking configurations at the failover site. Failover plans can automate the failover process, enabling one-click site failover.

HPs StoreOnce provides the ability to store and replicate backups enabling a tiered disaster recovery strategy. HP StoreOnce backup systems are purpose-built D2D backup appliances providing highly efficient capacity utilization with built-in deduplication to reduce the footprint of backup data as much as 95%—delivering storage cost efficiency while enabling more recovery points for rapid restore of VMs from backup images. The StoreOnce delivers the industry's fastest backup speed -- 139 TB/Hr reducing the backup window and enabling applications to be available longer. For enterprise data centers the StoreOnce 6500 scales from 120 TB raw (72 TB usable) to 2240 TB raw (1728 TB usable). The StoreOnce scale-out architecture allows you to add nodes to match your data growth. StoreOnce supports in-flight encryption using IPSec and at-rest encryption using industry standard AES 256-bit encryption. HP StoreOnce also delivers centralized system recovery for virtual or physical servers (from p2v or v2p) from a single backup.

Veeam's SureBackup and SureReplica automatically verify the recoverability of every VM backup and replica. SureBackup automatically starts the saved VMs in an isolated Virtual Lab environment. It then goes on to perform a set of tests checking for things like the heartbeat, networking and application status. After the tests are complete, SureBackup sends a status report to your mailbox indicating the recoverability of all your VM backups. Similarly, SureReplica automatically tests every restore point in every VM replica for recoverability. SureReplica validates VM replica data for consistency, checks the replica configuration and tests the replica by running it to the required restore point in an isolated Virtual Lab. SureReplica then creates a report detailing the recoverability of all VM replicas. SureBackup and SureReplica guarantee that your VMs are recoverable and they do so automatically.

Built-in WAN Acceleration utilizes global caching, variable block length data fingerprinting and traffic compression to reduce bandwidth requirements by an order of magnitude and to get VMs offsite up to 50 times faster than transferring raw data. Best of all, there are no appliances or virtual machines to deploy, or host-based agents to install. WAN Acceleration requires no changes to existing network infrastructures. Basically, a WAN accelerator works by caching duplicate files (or parts of files) so they can be referenced in the global cache instead of having to be sent across the WAN again.

Veeam Backup & Replication provides five levels of compression that allow you to set up the right balance of storage consumption, job duration, and backup proxy load. Data sent across the WAN link can be secured with end-to-end AES-256 encryption using a password. Optionally, you can leave local backups unencrypted for faster backup and restore performance, then encrypt backups that are copied to offsite targets or to tape.

For cloud-based disaster recovery, Veeam provides Cloud Connect, a cloud-agnostic Veeam Backup & Replication component that lets ISPs act as cloud repositories that you can use to store your Veeam backups and perform recoveries from. You don't need any additional software, but you do need to find an ISP that offers Veeam Cloud Connect support. You can use Veeam's Service Provider Lookup to find ISPs that offer Veeam Cloud Connect repositories.

Welch Foods Uses Veeam Replication for Disaster Recovery

Welch Foods, Inc., manufactures its famous grape juice and other products 24×7. During harvest time in the fall, grapes are delivered to Welch's processing facilities at all hours of the day and night. Welch's IT infrastructure must be continually available. If there's a problem during harvest time, delivery trucks might be delayed or stopped, which would significantly impact the company's operations. To ensure continuous operation of its IT infrastructure, Welch conducts disaster recovery testing throughout the year. Welch's requires that its critical applications and data must be recoverable within four hours. This includes nearly 200 VMware vSphere VMs running a variety of applications including AD, SQL Server, Exchange, and SharePoint.

Welch and Focus Technology Solutions (the company's enterprise-level technology solutions provider) chose Veeam Backup & Replication to support Welch's disaster recovery strategy and enable its always-on business. Two Veeam recovery features that are most important to Welch's are SureBackup and SureReplica, which verify the recoverability of every backup and every replica. Veeam automatically starts a backup or replica in an isolated environment called a Virtual Lab. The Virtual Lab tests the backup or replica and creates a report on its state and condition. Welch randomly tests backups and replicas for all critical VMs.

George Scangas, manager of IT architecture at Welch's, says: "Before we began using Veeam, disaster recovery testing could take nearly two days because of recovery problems and numerous calls to the vendor for technical support. Because Veeam is so easy to use and offers so many recovery options, DR testing now takes just a few hours. Veeam recovery is so fast and straightforward that we don't even need to be onsite for testing anymore, which saves us time and travel." You can learn more about how Welch uses Veeam for data protection and disaster recovery in "Welch's Harvests Data Protection with Veeam for Reliable Recovery in Any DR Situation."

Veeam and HP: It Just Works

In today's modern datacenter, availability is paramount and data protection must be built into the infrastructure. It's not something that can be added on later. The combination of HP storage solutions and Veeam data protection software increases your application availability while minimizing disruption and downtime. Veeam and HP provide fast recovery of VMs, files, and other application objects, delivering RPOs and RTOs of less than 15 minutes. Veeam Availability Suite includes Veeam Backup & Replication for enterprise-level data protection and Veeam ONE for monitoring reporting and virtualization management. The Veeam Availability Suite combined with HP's efficient and powerful 3PAR StoreServ, StoreVirtual, and StoreOnce is a solution that provides your business with data protection without limits.

© Copyright 2015 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.