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## HOW DELL EQUALLOGIC AUTO-SNAPSHOT MANAGER/VMWARE EDITION HELPS PROTECT VIRTUAL ENVIRONMENTS

Protecting and restoring virtual machines (VMs) can be slow and inefficient, and can take precious server resources away from critical applications. Dell™ EqualLogic™ Auto-Snapshot Manager/VMware Edition enables administrators to quickly and easily create hypervisor-aware snapshots of VMs—helping simplify data management, enhance scalability of data protection and recovery, and increase application performance.

**A**s organizations continue to consolidate their IT infrastructures through virtualization, reliability and recoverability are becoming increasingly important. In particular, because physical servers running multiple virtual machines (VMs) can support more applications than non-virtualized single-application servers, uptime requirements for virtualized servers are typically much higher than those for non-virtualized servers. In fact, consolidated environments are often expected to support operations requiring 24/7 uptime. As a result, rapid recovery and restore times can be critical to maintaining business continuity.

However, data protection and recovery can be a complex process in consolidated virtualized environments, and high uptime requirements typically reduce the time available for backup operations. Although traditional tape- and disk-based methods are essential to comprehensive backup strategies, they can also be slow and disrupt business continuity. For that reason, many organizations are adding a step in their data protection methods by utilizing the built-in capabilities of VMware® virtualization software such as VM snapshots, which provide an additional layer of data protection. Taking a VM snapshot involves placing

the VM in a quiesced state, taking a point-in-time copy, and storing it within the VMware Virtual Machine File System (VMFS). Although this method can be well suited for small deployments, as the virtualized infrastructure grows, advanced tools often become necessary to support increased scalability, automation, and recoverability. Software has been introduced that integrates the advantages of VM snapshots with storage area network (SAN)-based solutions; however, many of these products are complex and require costly add-on licenses.

Dell EqualLogic PS Series Internet SCSI (iSCSI) SAN arrays include EqualLogic Auto-Snapshot Manager/VMware Edition, a data management tool that enables administrators to quickly and easily create and recover hypervisor-aware SAN-based snapshots of VMs. This approach helps simplify data management, enhance scalability and recoverability, and increase application performance. Auto-Snapshot Manager/VMware Edition is part of a comprehensive suite of data management and protection tools available on EqualLogic PS Series iSCSI SANs at no additional charge (see the “Providing multi-layer data protection for virtualized environments” sidebar in this article).

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## DEPLOYING TRADITIONAL SERVER-BASED VM SNAPSHOTS

To enhance recoverability and help maximize server uptime, organizations often choose to augment traditional backup methods with VM snapshots. However, creating and recovering VM snapshots at the server or hypervisor level can present challenges. For example, the creation of server-based snapshots can be slow and may take server resources away from critical applications. Server performance can be negatively affected, especially as the environment grows. And recovery can be slow and negatively affect performance.

Snapshots initiated by a virtualized server can also take up substantial amounts of data storage space. For example, when a VM snapshot is taken through VMware software, the software stores the journal log files in addition to the VM itself. If the server operates continually in this mode, the VMware software eventually fills up the volume, leading to excessive resource constraints on the storage, host processor, and memory.

## SUPPORTING SAN-BASED VM SNAPSHOTS

To help maintain the performance of virtualized servers and enhance the scalability of creating and recovering VM snapshots, Dell EqualLogic PS Series iSCSI SANs include EqualLogic Auto-Snapshot Manager / VMware Edition, a data management tool that enables administrators to create and recover hypervisor-aware VM snapshots at the SAN level.

Auto-Snapshot Manager / VMware Edition is a stand-alone Web-based application that integrates directly with the VMware application programming interface to create hypervisor-aware VM snapshots. It takes advantage of the built-in snapshot facilities of EqualLogic PS Series iSCSI SANs and utilizes an intuitive, easy-to-use graphical user interface (GUI) that enables administrators to create VM snapshots on demand or to

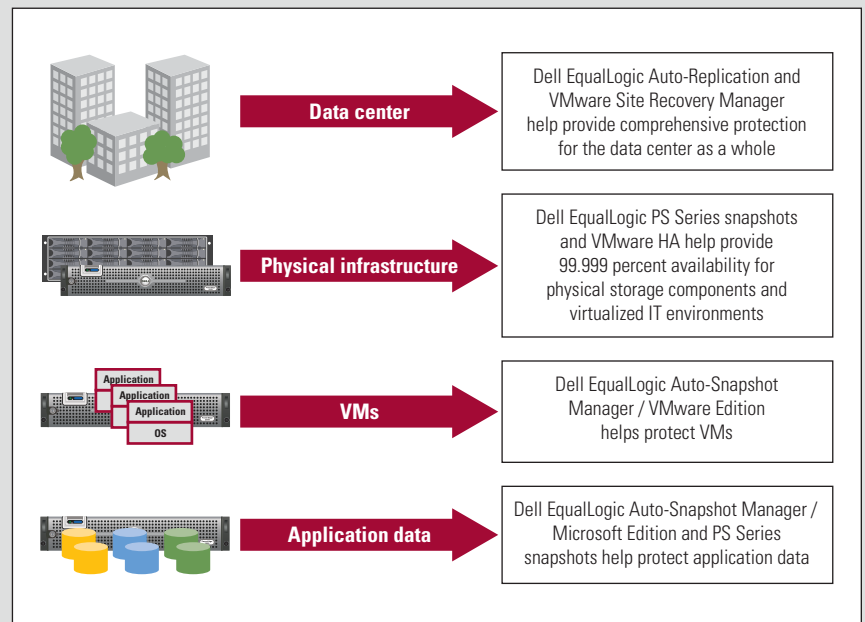
# PROVIDING MULTILAYER DATA PROTECTION FOR VIRTUALIZED ENVIRONMENTS

In response to the challenge of protecting today's complex virtualized environments, many organizations are exploring a multilayered approach to disaster recovery and data protection—including data protection at the application, virtual machine (VM), physical infrastructure, and data center levels (see Figure A).

For data protection at the application level, Dell EqualLogic PS Series Internet SCSI (iSCSI) storage area network (SAN) arrays include EqualLogic Auto-Snapshot Manager / Microsoft Edition, a data management tool that enables administrators to quickly and flexibly create and recover application-aware snapshots of Microsoft® Windows®, Exchange, and NT File System (NTFS) data as well as standard PS Series snapshots for non-Microsoft operating systems. For data protection at the VM level, EqualLogic PS Series iSCSI SANs also include Auto-Snapshot Manager / VMware Edition, a data management tool that enables administrators to create and recover hypervisor-aware SAN-based snapshots of VMs.

To help maximize the uptime of physical storage components, EqualLogic PS Series iSCSI SANs help achieve 99.999 percent availability, and when used with VMware High Availability (VMware HA) failover protection software help ensure the availability of virtualized IT environments. Finally, to help protect the data center as a whole, EqualLogic PS Series iSCSI SANs include PS Series Auto-Replication and VMware Site Recovery Manager integration to support automated disaster recovery of virtualized data centers.

The comprehensive data protection and disaster recovery tools available in EqualLogic PS Series iSCSI SAN arrays also follow the design tenets—easy to implement, easy to install, and easy to procure—of the arrays themselves. Administrators can implement comprehensive data protection and disaster recovery easily and cost-effectively, and because EqualLogic PS Series arrays are designed for ease of use, organizations can allow additional time and resources for developing their data protection and disaster recovery plans. Together, the data management tools and hardware reliability features provided by EqualLogic PS Series iSCSI SANs can help simplify data management, increase uptime, and facilitate fast, scalable data protection and recovery throughout the enterprise.



**Figure A.** Taking a multilayer approach to data protection and disaster recovery in virtualized environments with Dell EqualLogic PS Series iSCSI SANs

## HOW PETERSON SULLIVAN PROTECTS THE PAPERLESS OFFICE

**Dell EqualLogic Auto-Snapshot Manager/VMware Edition enables a Seattle accounting firm to protect its data in seconds—rather than hours.**

Peterson Sullivan PLLC may have been founded during the Eisenhower era, but today this large Seattle accounting firm uses the latest technology to help its professionals complete work on time and on budget. For example, the firm recently completed one of its largest IT initiatives ever—a multiyear project to convert to a completely digital, paperless office.

To accomplish this goal, the firm consolidated and virtualized its server and storage infrastructures, deploying Dell PowerEdge™ 1950 servers virtualized with VMware Infrastructure 3 software to run a wide array of applications, and a Dell EqualLogic Internet SCSI (iSCSI) storage area network (SAN) to store the thousands of PDF documents scanned in by members of the firm each day. For backup and recovery, the IT group utilized local disk backups and deployed an additional SAN to enable remote data backups and archiving.



**“With the previous process, it could take minutes to several hours to back up our virtual machines. With the Auto-Snapshot Manager/VMware Edition, it takes just seconds to protect and recover from hypervisor-aware SAN-based snapshots.”**

—Cody Page  
IT manager at Peterson Sullivan PLLC  
September 2008

Although the IT group already had a solid backup strategy in place, the team decided to explore ways to capture virtual machine (VM) data frequently throughout the day to achieve more granular and faster recovery of the environment. “We started backing up full virtual machine images to the SAN and sending backups off-site for disaster recovery,” says Cody Page, the firm’s IT manager. “The application we were using to create backups worked fine, but the process was lengthy and complicated.”

The Dell Support team recommended evaluating Dell EqualLogic Auto-Snapshot Manager/VMware Edition software. Page’s group was able to start using the new tool quickly. “We had to invest hundreds of hours into our current backup application to get it to work,” says Page. “With the Auto-Snapshot Manager/VMware Edition, we were up and running in about an hour.”

### REDUCING TIME TO PROTECT DATA FROM HOURS TO SECONDS

By creating space-efficient point-in-time snapshots of data instead of entire VM images, the IT group expects to accelerate the process of protecting and restoring data while also preserving storage capacity. “The Auto-Snapshot Manager/VMware Edition will help us speed up virtual machine protection dramatically,” says Page. “With the previous process, it could take minutes to several hours to back up our virtual machines. With the Auto-Snapshot Manager/VMware Edition, it takes just seconds to protect and recover from hypervisor-aware SAN-based snapshots.”

Auto-Snapshot Manager/VMware Edition also enables the IT group to automate the creation of snapshots over the course of the day. “If you back up virtual machines just once or twice a day, you stand to lose lots of work in the event of a problem,” says Page. “We can use Auto-Snapshot Manager to create snapshots every hour or two, throughout the day, all without interrupting application availability.”

Auto-Snapshot Manager/VMware Edition also makes it simple to create distinct snapshot schedules for different VMs. “We can use the folder structure to logically group certain virtual machines together and then schedule snapshots for each group at different frequencies,” says Page. “We might want to capture one group every two hours while another once a day. Being able to fine-tune the scheduling helps us optimize our resources.”

Easily integrated into the existing backup process, the Auto-Snapshot Manager/VMware Edition tool is expected to facilitate an added layer of data protection. “We will continue to conduct image-level backups. But now we have a way to capture and restore document changes at a finer level,” says Page.

### READYING FOR ONGOING DATA GROWTH

As the document scanning continues, the firm sees no end in sight for its data growth. With a new IT infrastructure and easy-to-use management tools, the IT group is now confident that it can safeguard that data. “Protecting our employees’ work and our clients’ data is essential for our business,” says Page. “We now have the hardware and the management tools to protect data without excessive costs or administrative burdens.”

automate snapshot creation through a built-in scheduler (see Figure 1).

Auto-Snapshot Manager/VMware Edition interprets and preserves VMware folder structures, and can create snapshots at several levels—including snapshots of VMs, VM folders, data stores, clusters, and even entire VMware deployments. To create a VM snapshot, Auto-Snapshot Manager/VMware Edition sets the VM in snapshot mode, takes a SAN-level snapshot of the volume the VM resides on, and then returns the VM to its native production mode.

Once taken, snapshots can be rapidly restored from multiple recovery points. In particular, Auto-Snapshot Manager/VMware Edition has a quick rollback feature for fast recovery and supports automated rollbacks and selective restores using native VMware tools. Snapshots can also be offloaded and used for test and development purposes, including performance analysis, data mining, and testing of software builds, upgrades, and patches.

### ENHANCING SCALABILITY AND RECOVERABILITY

By moving snapshot processing from virtualized servers to SANs, Dell EqualLogic Auto-Snapshot Manager/VMware Edition can significantly reduce the load on virtualized servers—which in turn helps free processing power for critical applications and enhance overall server scalability. In addition, because Auto-Snapshot Manager/VMware Edition snapshots are designed to be space efficient, they enable organizations to preserve storage capacity and enhance storage scalability.

Auto-Snapshot Manager/VMware Edition can also help organizations enhance recoverability (see the “How Peterson Sullivan protects the paperless office” sidebar in this article). For example, because Auto-Snapshot Manager/VMware Edition is designed to create snapshots without affecting server performance, organizations can reduce the interval between snapshots to help minimize the risk of data loss and help reduce

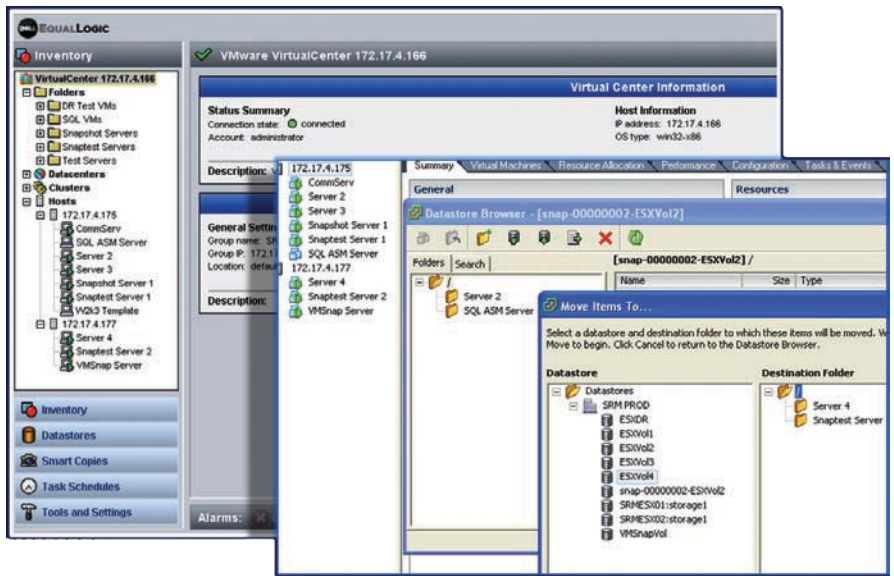



Figure 1. Streamlining administration with the Dell EqualLogic Auto-Snapshot Manager/VMware Edition GUI

recovery times. And because Auto-Snapshot Manager/VMware Edition supports rapid rollback to the most recent snapshot, organizations can recover quickly following a failure, helping avoid the long recovery time associated with recovering from traditional sequential tape media.

Additionally, Auto-Snapshot Manager/VMware Edition can help simplify data management tasks. For example, the simple, easy-to-use GUI enables administrators to create and recover snapshots on demand or schedule automated snapshots. Furthermore, the ability to create snapshots at each level of the VM hierarchy enables administrators to target snapshots for the particular needs of their organizations.


### PROTECTING VIRTUALIZED ENVIRONMENTS

For many organizations, VM snapshots have become a vital part of a comprehensive data protection and recovery strategy. By integrating space-efficient SAN-based snapshots with VM snapshots to create hypervisor-aware data protection, Dell EqualLogic Auto-Snapshot Manager/VMware Edition can help organizations not only protect their

virtualized environments, but also simplify data management, enhance scalability and recoverability, and increase application performance. 

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