



Simplified Business Continuity with VMware Virtual Infrastructure and Data Domain Deduplication Storage

Consolidated Backup, Recovery and Disaster Recovery

Business Continuity Challenges

Reliable business continuity must be supported by a comprehensive approach to data backup, recovery and offsite disaster recovery. Faced with budget constraints and limited options for moving data offsite, most organizations have compromised their business continuity preparedness. For these organizations, a site outage or system failure can significantly disrupt business operations—and even put the organization out of business.

Common business continuity challenges include:

- **High costs.** Many business continuity solutions require a significant investment in additional hardware, software and services. Disaster recovery plans in particular often require duplicate data center infrastructure, resulting in a proliferation of costly, underutilized servers.
- **Failure to meet recovery point and recovery time objectives.** Heavy dependence on tape-based strategies for moving data offsite raises costs while lowering service levels. The recovery point can only be as good as the last tape rotation, while the time required to stream data from tape is unnecessarily long.
- **Overly complex and unreliable solutions.** Managing rapid system rebuilds, tracking tape media, and managing complex recovery is beyond the capability of most tape-based disaster recovery approaches.

Benefits of VMware Virtual Infrastructure and Data Domain Deduplication Storage

Organizations using VMware virtual infrastructure to improve the DR components of their business continuity plans have realized many benefits:

- **Reduced downtime.** Organizations can eliminate much of their planned downtime and reduce unplanned downtime, including dramatic reductions in point-of-recovery and time-to-recovery for disaster scenarios.

- **Lower costs.** Virtual infrastructure makes it possible for companies to reduce costs by slashing the need for additional hardware and specialized software.
- **Simplified processes.** Virtual infrastructure removes the complexity of maintaining duplicate physical systems for disaster recovery. It also eliminates and streamlines much of the recovery process.

Extending the value of server consolidation to data and storage just makes sense. Data Domain deduplication storage can help users attain additional efficiencies:

- **Longer retention.** Operational recoveries are executed from disk, not tape, for fast, simple and reliable recovery.
- **Network-efficient replication.** Deduplicated data is easily moved over the WAN to a disaster recovery site using 99% less bandwidth.
- **Storage consolidation.** Eliminate redundant data found in the backups of virtual machines and simplify the protection of remote sites across the distributed enterprise.

Lowering Disaster Recovery Costs with Virtual Systems Infrastructure and Data Domain Deduplication Storage

VMware virtual machines are *hardware-independent*, meaning that any physical server can serve as a recovery target for any virtual machine. As a result organizations can significantly reduce the cost of hardware for application recovery by using existing servers for recovery targets and disaster recovery testing. Many organizations have realized significant reduction in capital budget expenditures by provisioning disaster recovery sites with virtual systems, also benefiting from using less floor space and lowering energy consumption.

The savings in physical infrastructure costs is just the first step. With VMware virtual infrastructure, complex multi-step system recovery procedures are simplified and dramatically reduced. Dependence on specialized

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Data Domain

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Partner Overview

Deduplication storage systems optimized for disk backup and network-based disaster recovery (DR).

Key Business Needs

Data Domain deduplication storage provides a consolidated protection and DR solution for cost-effective, long-term retention of combined vmdk and application data, shortened backup windows, multiple point-in-time copies of vmdk files, and high bandwidth replication for improved DR.

Key Business Benefits

- Minimize network bandwidth; enable network efficient replication for DR.
- Massive storage reduction; extend consolidation benefits to data and storage by deduplicating highly redundant copies of very similar or identical block data. Multiple snapshots of the same system can be preserved throughout the day or week, utilizing minimal additional space.
- Speed; send system images to VCB proxy servers quickly to be mounted and protected as fast as possible.

Business Results

- 10–30x cost savings
- 99% reduction in bandwidth
- Lowered administrative burden
- Faster data recovery
- No lost data

VMware and Data Domain

Data Domain and VMware solutions together can result in:

- Up to 40–60x reduction of data including vmdk files
- Radically improved point-in-time DR through electronic vaulting
- Seamless integration with the latest VMware backup processes
- Ensured recoverability with Data Invulnerability Architecture

Products

The Appliance Series, Gateway Series and DDX Array Series

software for bare-metal recovery and operating system recovery is eliminated. Because virtual machines are completely encapsulated in a small number of files, they can be restored to any hardware. This encapsulation also makes it possible to use replication software to replicate entire virtual machines to a recovery site, dramatically speeding recovery time to just a few hours.

VMware creates a Virtual Data File (vmdk) for each virtual client. Rapid system rebuild requires preservation of these data objects, which are 2GB or larger data files. When the vmdk is preserved, the state of the virtual client is preserved from the point of failure and can be rapidly recovered on new VMware systems. Data Domain deduplication storage offers significant advantages in reducing the storage footprint required to preserve vmdk files by eliminating what is typically high degrees of redundancy between them. Data Domain inline deduplication and replication can also move deduplicated vmdk files efficiently over WAN connections to disaster recovery locations, providing the fastest time to DR-readiness.

The unique structure of vmdk files typically includes the redundant rewriting of many empty blocks every time a vmdk file is captured. Data Domain deduplication is ideal for eliminating these redundancies by removing duplicate blocks, significantly reducing the size, storage and replication costs of these files. This data reduction lowers the cost of operations by reducing storage and network bandwidth requirements by 40–60x on average.

VMware virtualized server infrastructure combined with Data Domain deduplication storage also provides a more reliable disaster recovery plan. System recovery processes are simplified and automated, while disk-based operations raise the speed and reliability of data recovery. Time-to-recovery objectives are improved, testing of disaster recovery plans is less

time-consuming and less costly, and training new personnel to operate disaster recovery procedures is easier.

Consolidate Backup and Disaster Recovery for Your VMware Environment: Data Protection Challenges

As data continues to grow exponentially, the need for rapid backup and reliable recovery continues to put stress on tape infrastructures. Slow performance and reliability issues with tape make it a poor choice for safeguarding data, and have caused a growing number of organizations to adopt disk-based data management strategies. Organizations have also recognized the advantages of network-based electronic vaulting to move data offsite as soon as it is protected. However, without a massive reduction in data, disk storage and replication bandwidth have been too expensive to make these options practical in most environments.

Data Domain deduplication storage makes consolidated backup and replication for disaster recovery practical, with radical reductions in the storage footprint required to store backup and archive data.

Data Domain deduplication storage is ideal for organizations with VMware Infrastructure 3 or ESX Server systems encountering any of the following challenges:

- The lack of a single storage platform supporting backup and disaster recovery solutions for combined vmdk and application data backups.
- Long backup and recovery windows required to protect large vmdk files.
- Exorbitant storage costs to retain multiple backup copies on disk, including vmdk files.
- Prohibitively high replication costs, forcing a continued dependence on tape rotation for disaster recovery.

Simplified Consolidation Benefits

Server consolidation with VMware technology minimizes your server footprint with 70-80% reduction in operational and capital expense budgets. Data Domain inline deduplication storage can help extend the same consolidation benefits to your data and storage footprint.

Data Domain deduplication benefits include:

- **Lower costs.** In many cases, tape-based data protection survives because organizations need low-cost media for long-term data retention. Data Domain deduplication storage makes it possible to minimize and eliminate tape infrastructure, because dramatic data consolidation preserves data on disk at a cost less than tape – less than \$0.35/GB. This is especially critical in VMware environments, which include the need to protect vmdk files.
- **Efficient replication.** Eliminate tape dependency for disaster recovery and long-term data retention. Replicate data offsite as soon as it is protected, and dramatically improve the point-in-time of recovery and avoid data loss. Combine replication of vmdk files with application data for comprehensive disaster recovery preparedness. Replicate data among physical and virtual systems for flexible use of VMware systems, in particular to facilitate disaster recovery on a virtual server infrastructure.
- **Seamless integration and operational simplicity.** Maintain native support in VMware for disk-based vmdk backups, VMware Consolidated Backup (VCB) deployments, and support for traditional backup software requiring no changes to existing network infrastructure or backup software and policies. Consolidate protection of virtual and physical systems together on the same storage platform, for maximum advantages.

- **“Green IT” efficiencies.** Radically reduce the storage footprint to gain significant savings in the costs associated with floor space, power and cooling.
- **Data invulnerability.** Disk performance and reliability dramatically improves service levels and avoids data loss, for local backup and recovery operations as well as for WAN disaster recovery and long-term data preservation.

The High Value of Inline Deduplication

Data Domain deduplication operates inline with the backup operation, to remove duplicate blocks before data is written to disk. This compares favorably with post-process implementations, which first write all data to disk – requiring additional disk space to be allocated and available – and then perform deduplication. Inline operations also perform faster than post-process methods. Data Domain inline deduplication enables large datasets to be stored on dramatically less disk storage, minimizing the need for tape devices in most environments.

The Advantage of VMware Consolidated Backup (VCB) Protection

VMware systems offer a better way to capture and protect system data, through a Consolidated Backup approach, which removes the load of running backup jobs from the ESX Server systems entirely. Using this method, backup software is run on a VMware proxy server connected to a SAN. VMware systems enable backup software to mount vmdk files, and to back them up just as if the backup software were running on the Virtual Machine itself.

In this way, the VCB approach preserves object-level recovery of individual files from protected file systems while maximizing ESX Server performance.

Data Domain deduplication storage is an ideal complement for enabling VCB data protection, because of the way in which all types of data protected from VMware systems can be stored on the same Data Domain system to gain deduplication benefits. Data Domain deduplication storage can also be used to store protection copies from VMware and non-VMware systems, for maximum storage consolidation advantages.

LEARN MORE

To learn more about VMware solutions and products, visit our Web site at www.vmware.com or contact us at us at 1-877-4VMWARE.

To learn more about Data Domain deduplication storage benefits and how they work with VMware deployments, visit the Data Domain web site at:

<http://www.datadomain.com>