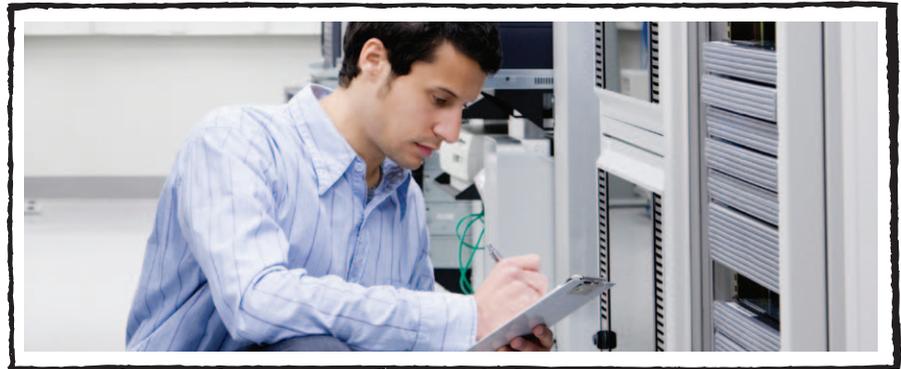# Terremark Delivers Breakthrough Cloud-Based Disaster Recovery Solutions with NetApp Storage



## KEY HIGHLIGHTS

**Industry**
IT services

**The Challenge**
Provide robust, secure cloud-based DR services that are cost effective for customers and for Terremark.

**The Solution**
Deliver cloud-based disaster recovery (DR) solutions built on a NetApp® storage infrastructure including NetApp FAS6040 and NetApp FAS3020 storage systems running the Data ONTAP® operating system.

**Benefits**
- Reduced data storage capacity needed for virtual machines by at least 50%
- Reduced administrative time and costs two- to threefold
- Reduced customer RPO and RTO from days to hours or minutes

## Customer Profile

As a leading global provider of IT infrastructure services, Terremark Worldwide provides managed hosting, colocation, networking, and security services. Leveraging data centers in the United States, Europe, and Latin America and access to network connectivity from more than 160 global carriers, Terremark delivers a comprehensive suite of managed solutions to government, enterprise, and Web 2.0 customers. In 2009, Terremark was named VMware Service Provider of the Year.

## The Challenge
### Mounting disaster recovery (DR) costs and risks

Terremark's cloud-based DR offering is among the company's most sought-after services, and it is no wonder. DR can be challenging because of its complexity and high costs, yet it cannot be ignored. Organizations today face increasing DR pressures caused by soaring downtime costs and more stringent IT service-level requirements. And, although the cost of downtime incidents can be devastating, the cost and resources required to implement all of the enterprise services required for successful DR can be daunting.

## The Solution
### An end-to-end virtual private environment

To help organizations with mission-critical DR, Terremark built a world-class cloud-based DR solution that is comprehensive yet cost effective. "Our virtualized DR services are elastic and easily scale as customer needs change," says Mike Fink, director of Cloud DR Solutions for Terremark. "We offer a capacity-on-demand pricing model and provide all of the associated enterprise DR services—not just replication and failover, but also security, backup, and restoration."

Terremark ensures the security of its partitioned, multi-tenant cloud environment, from virtual private devices through to private firewalls, routers, virtual machines, and virtual storage controllers. "We provide a secure, virtual private environment across the full stack," says Fink. "We layer our own security services on top of our IP-based virtual environment and secure everything end to end."

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**Mike Fink**
Director of Cloud DR Solutions, Terremark Worldwide

## World-class storage for cloud-based DR

While exhaustive, the search for storage in Terremark's virtual private environment ended quickly—with NetApp solutions. The company has NetApp FAS6040 and NetApp FAS3020 storage systems supporting a virtualized environment with VMware® vSphere™ Enterprise Edition and Cisco Catalyst 3750 Gigabit Ethernet switches. "Based on cost, ease of management, replication technologies, and synergy with VMware and Cisco technologies, NetApp was the clear choice," says Fink.

A vital component of Terremark's cloud-based infrastructure is NetApp SnapManager® for Virtual Infrastructure software, which works with VMware vCenter™ to automate and simplify backup and restore operations. "SnapManager for Virtual Infrastructure simplifies management and increases productivity for all of our backup, restore, and DR operations in the VMware environment," says Fink. "It helps keep our costs and administrative overhead low."

On the data protection side, Terremark wields NetApp SnapMirror® for flexible, reliable, protocol-agnostic replication over standard IP. NetApp FlexClone® and SnapRestore® enable nondisruptive DR testing and instantaneous recovery.

NetApp's core storage system and data reduction technologies, including NetApp deduplication, not only support Terremark's VMware environment but also help reduce the company and its customers' physical storage footprints by 50% or more. Another crucial tool for Terremark is NetApp MultiStore® software, which provides secure partitioning of shared storage and network resources so multiple domains and servers can be consolidated on a single storage system without risk.

To simplify storage management, NetApp Operations Manager software enables administrators at Terremark to monitor and manage all of the company's NetApp systems, complete with alerts, reports, performance, and configuration tools, to keep the NetApp storage infrastructure aligned with customer requirements. "We use almost all of the features Operations Manager offers," says Fink. "It allows us to grow our business without adding administrative resources."

For SAN-based replication, Terremark's DR customers use NetApp storage systems. "We evaluated other SAN-based replication solutions and found NetApp SnapMirror to be superior," explains Fink. "So for SAN-based replication, our customers use NetApp."

## Business Benefits
### Scalable and easy to manage for customers

Terremark installs NetApp storage systems at numerous customer sites, from small businesses to large enterprises. According to Fink, NetApp provides a range of price points and systems that scale to meet the needs of businesses of all sizes.

Terremark clients can take advantage of easy-to-use NetApp Snapshot™ software to back up their data at scheduled intervals. They also use NetApp SnapManager for SQL® or SnapManager for Exchange to capture consistent Snapshot copies of their databases. According to Fink, SnapManager enables customer databases to be backed up correctly—alleviating the possible need to spend hours checking databases for errors after a disaster or data recovery event.

Fink also notes that the NetApp tools are highly scalable and easy to manage. "When we install NetApp systems and software at customer locations, we can rest assured that they won't have to spend weeks or months in classes, whether they are novices or experts," says Fink. "The ease of use and streamlined manageability of NetApp for customers is a differentiating feature for us."
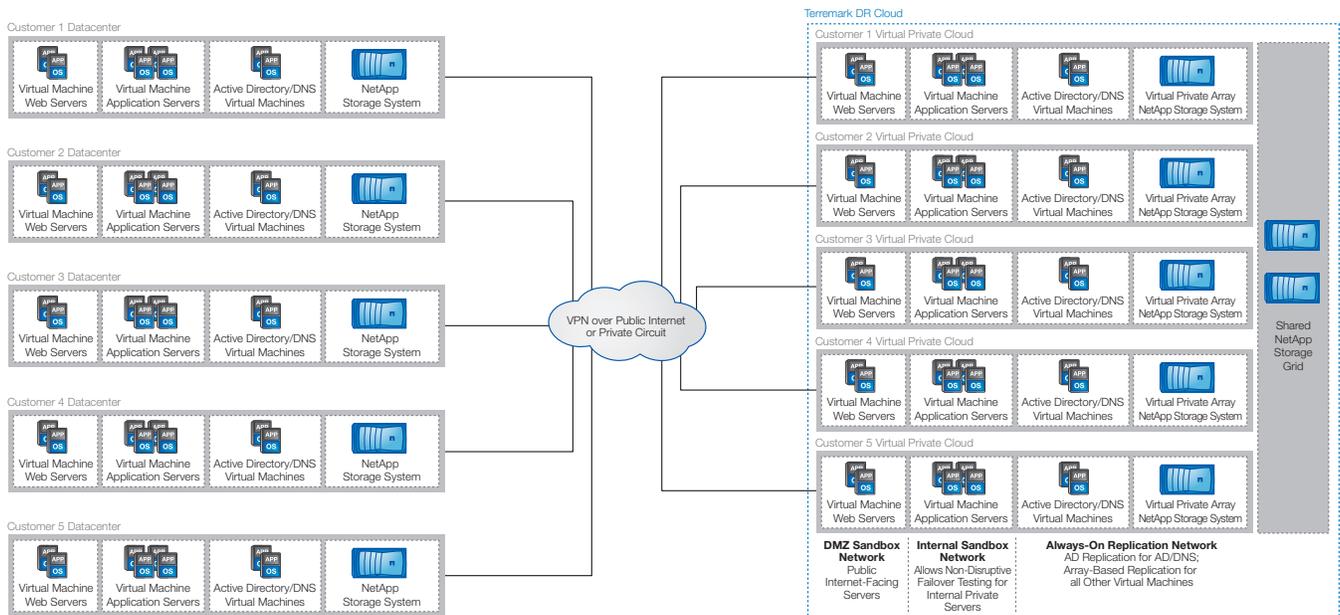
**Figure 1) Terremark Worldwide storage infrastructure.**

### Nondisruptive DR tests for both physical and virtual machines

NetApp's industry-leading replication is extremely fast and reliable, enabling Terremark to meet stringent service-level agreements (SLAs), including a standard one-hour recovery point objective (RPO) and a four-hour recovery time objective (RTO)—both adjustable based on customer requirements. NetApp solutions are also ideal for DR, because Terremark can test customers' DR plans nondisruptively using NetApp FlexClone software—a service it provides once a year as part of its standard package.

"FlexClone is unique in the DR industry because customers can test their DR plans without breaking their mirrors. We can reliably test customers' virtual machines using FlexClone and VMware to nondisruptively provide a full data center failover simulation," explains Fink. "When customers invest in a DR solution, they don't want to impact their RPO and RTO during failover testing. FlexClone allows us to test nondisruptively and make sure that we have an effective disaster response procedure so that the customer's investment in the technology is money well spent."

### Reduced costs and storage needs

Fink notes that NetApp keeps costs low, both for Terremark and its customers. With NetApp deduplication, Terremark

routinely reclaims 50% to 70% of storage, depending on the application. "Storage is always among the most expensive portions of any DR strategy," says Fink. "When you tell customers they can reduce storage costs by 50% or more using deduplication, it makes a very compelling argument."

Terremark takes advantage of other NetApp capabilities to reduce operating costs, resulting in savings that can be passed on to clients. With the broad array of software NetApp provides, Fink notes that it takes two to three times less time to manage NetApp systems when compared to legacy offerings, significantly reducing overhead.

NetApp's support for multiple protocols further reduces costs and provides flexibility for customers. Clients can use their preferred protocols—Fibre Channel, iSCSI, CIFS, and so forth—but on the Terremark side, the company uses more cost-effective IP-based protocols—iSCSI and NFS. With multiprotocol support, the company can also provide tape backups via NDMP as a value-added service to customers. "NetApp's multiprotocol support is critical for us," says Fink. "Regardless of what setup the customer has, we can use IP-based protocols on our side and avoid paying tens or hundreds of thousands of dollars on SAN connectivity."

### Rock-solid security in a multi-tenant environment

With NetApp MultiStore, Terremark can virtually guarantee the security of customers' virtual environments. "Without MultiStore, we would have to buy a NetApp array for every customer. That would be prohibitively expensive and, in reality, we would just be back to providing the same old data center services like power, cooling, and rack space," says Fink.

Key to the Terremark DR solution is a unique service-oriented infrastructure (SOI) based on NetApp, Cisco, and VMware that includes all server, storage, and networking hardware and software to facilitate sharing, reuse, and dynamic resource allocation. Important features of the SOI include elastic scalability, integrated data protection, advanced automation, and the ability to transparently migrate both applications and data across the infrastructure. "NetApp, VMware, and Cisco provide some of the best technologies the industry has to offer," says Fink. "Together, they offer unique synergies that greatly simplify the deployment and management of multi-tenant cloud infrastructures like Terremark's."

### Reduced RPO and RTO for customers

A global energy-services company is just one customer benefiting from Terremark's virtualized DR solutions. Based in an area with a high risk of

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**Mike Fink**
Director of Cloud DR Solutions, Terremark Worldwide

hurricanes and other natural disasters, the company needed a cost-effective DR solution with low RPO and RTO. Terremark implemented NetApp FAS2020 series storage at the company's primary data center, replicating data from Lotus Notes and other applications to Terremark's DR cloud. The company's RPO was reduced from days to 15 minutes, and RTO was reduced from days to one hour. The company also executed its first-ever successful DR test, without business disruption.

For Terremark, working with NetApp is a pivotal part of the secret to providing successful cloud-based DR services. "With NetApp, we have a trusted partner that is committed to our success and is constantly providing operating system upgrades, deduplication, and other powerful new functionality at no charge. You don't get that with other storage providers," says Fink.

## SOLUTION COMPONENTS

**NetApp Products**
NetApp FAS6040 and FAS3020 clustered storage systems

Data ONTAP 7G

SnapMirror

MultiStore

Deduplication

FlexClone

SnapRestore

Operations Manager

SnapManager for Virtual Infrastructure

SnapManager for SQL Server

SnapManager for Exchange

Snapshot technology

**Protocols**
CIFS, NFS, Fibre Channel, iSCSI

**Third-Party Products**
Cisco Catalyst 3750 Gigabit Ethernet switches

Cisco ASA 5500 Series

VMware vSphere 4

VMware Infrastructure 3

VMware vCenter 4

Riverbed WAN compression appliances

**Environment**
Applications: Lotus Notes/Domino, Microsoft Exchange 2000 or higher, others

Server platform: HP ProLiant DL385

Databases: Oracle®, Microsoft SQL Server, Progress, others

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