Dell™ DR4000
Replication Overview

Contents

Introduction 1
Challenges with Data Disaster Recovery 1
The Dell DR4000 Solution – A Replication Overview 2
Advantages of using DR4000 replication for disaster recovery 3
Summary 4

THIS TECHNOLOGY WHITE PAPER IS FOR INFORMATIONAL PURPOSES ONLY, AND MAY CONTAIN TYPOGRAPHICAL ERRORS AND TECHNICAL INACCURACIES. THE CONTENT IS PROVIDED AS IS, WITHOUT EXPRESS OR IMPLIED WARRANTIES OF ANY KIND.

© 2012 Dell Inc. All rights reserved. Reproduction of this material in any manner whatsoever without the express written permission of Dell Inc. is strictly forbidden. For more information, contact Dell.

Dell and the *DELL* logo are trademarks of Dell Inc. Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell Inc. disclaims any proprietary interest in trademarks and trade names other than its own.

March 2012

Introduction

In today's information age businesses data is critical and needs to be protected at all costs. Furthermore, compliance regulations impose additional requirements to protect and save the data. A variety of technologies are available in the marketplace for safeguarding critical data, ranging from tried and tested technologies such as RAID to advanced backup solutions. While these protect data from variety of risk factors such as hardware and software defects occurring locally, organizations of all sizes are considering an additional layer of protection that helps them manage risk better by replicating data to geographically distant places. Replication is essential to provide a level of protection that enables true disaster recovery – that is, the ability to resume business operations by restoring and recovering data efficiently.

Today the majority of companies back up data to tape and store tapes offsite as part of their disaster recovery strategy. However, on average 34% of all companies fail to test their tape backups, and of those that do, 77% have found tape backup failures. In addition to the failure rate of tapes, there are storage costs, the potential for lost tapes, mislabeling of tapes, and access to the offsite tape storage in the case of a disaster.

The Dell™ DR4000 Disk Backup System is a high-performance, disk-based backup and recovery appliance that is simple to deploy and manage, and offers unsurpassed Total Cost of Ownership (TCO) benefits. It delivers innovative features, such as inline deduplication and compression, advanced data protection, and replication. The DR4000 offers flexible replication architectures, enabling organizations realize the benefit of protecting against disasters, while still meeting strict backup and restoration time requirements.

Challenges with Data Disaster Recovery

Implementing an effective replication and disaster recovery strategy is an essential part of protecting mission-critical data. However, there are several challenges to implementing such a plan.

- **Rapid data growth**: Data is increasing exponentially, which places a huge burden on the backup and disaster recovery infrastructure, both in terms of cost and performance. Most organizations are gravitating towards a dedicated backup infrastructure that is also used as part of disaster recovery processes. New dedicated backup infrastructures must be built from the ground up to be able to handle the exponential growth in data.
- **Network bandwidth**: In order to meet the stringent recovery time objectives (RTO) and recovery point objectives (RPO) of today's mission-critical applications, it is essential to implement high speed networks between local and remote sites. Given that WAN bandwidth is not cheap, the backup infrastructure and disaster recovery procedures should be sensitive to the overall cost, which includes bandwidth expenses. Replicating data in its raw format takes a great deal of network bandwidth.
- **Storage footprint**: Because the backup infrastructure is normally used to restore data in a disaster recovery, you must account for the additional storage needed. Ideally, the storage would be designed to host multiple copies of production data, as well as having capacity to do specific disaster recovery efforts. This backup storage footprint will easily match or exceed the primary storage footprint if it is not managed well. Deduplication and compression are key technological innovations that can manage this.

- **Complexity**: An effective disaster recovery strategy requires careful balancing of the storage footprint, space efficiency, and network bandwidth – all of which is easier said than done. Part of the complexity is addressing how often to send tapes offsite, how long to retain data, who has access to the offsite storage, how to manage inventory of hundreds to thousands of disaster recovery tapes stored at an offsite location, and how to get tapes back in the case of a disaster.
- **Cost**: A comprehensive backup and disaster recovery infrastructure that addresses all the challenges above is typically very expensive. Several purpose-built products address these types of individual challenges, but they typically incur licensing costs for enabling each capability.

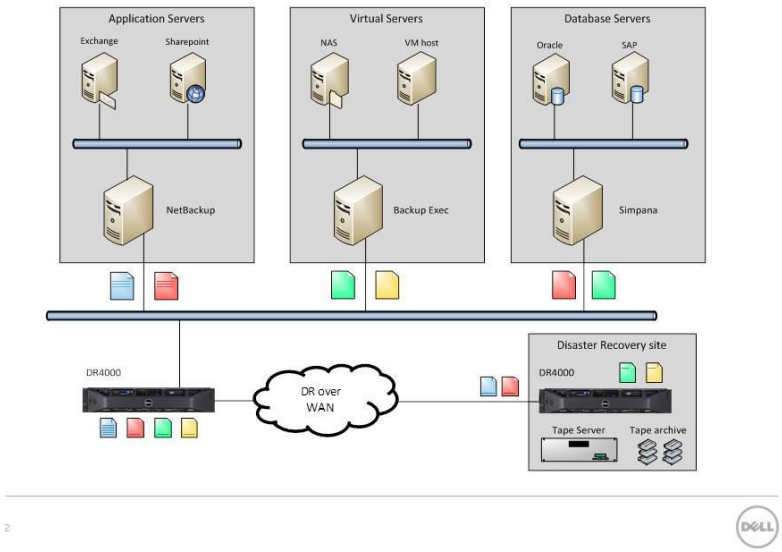
The DR4000 offers the best value in the marketplace to address the challenges of storage footprint, space savings, and bandwidth containment. When the advanced feature set is combined with an all-inclusive licensing model, the DR4000 delivers unmatched value in helping organizations implement the most comprehensive backup and disaster tolerance strategy.

The Dell DR4000 Solution – A Replication Overview

The DR4000 is a high-performance, disk-based backup and recovery appliance that is simple to deploy and manage. In addition to providing industry-leading deduplication and compression technologies, unparalleled data protection features, and an all-inclusive license model, the DR4000 comes with the following advanced replication features built in:

- **Flexible configuration**: The DR4000 replication allows for bi-directional 1:1 replication setup (one DR4000 as primary and one DR4000 as the target site). Each DR4000 can provide local backup and host remote backup images for remote DR4000's.
- **Policy based replication**: The following data movement policies enable complete, coherent, and fast replication of data. In addition, you can set time restriction and network throttling on replication to match individual infrastructures and policies
    - *Full Synchronization*: This mode is active when replication is first configured. When replication is configured, an initial full synchronization of local and remote sites starts.
    - *Log-based replication*: After the initial full sync, the DR4000 tracks incremental changes through in-built snapshot capabilities. Subsequent synchronization of the containers will synchronize only the incremental changes.
    - *Resync capabilities*: The replication solution allows for two-way resync, which provides an easy way to seamlessly move full data sets between primary and remote sites at any time and to bring a remote site that has been offline for an extended period of time back in sync with the primary site.
- **Link aggregation**: The DR4000 firmware enables bonding the four 1-GB ports or two 10-GB ports in an Automated Load Balancing (ALB) or 802.3ad bond.
- **Snapshot-leveraged replication**: The DR4000 firmware implements efficient snapshot capability. This enables the system to leverage snapshots to make a point-in-time checkpoint of a container, allowing for faster and safer data replication. This is done by replicating the snapshot and then applying all the changes that have occurred during replication to the container.

DR4000 Deployment with Disaster Recovery



Advantages of using DR4000 replication for disaster recovery

The DR4000 offers several key benefits to organizations looking to implement a disaster recovery strategy that emphasizes operational and space efficiency. The features mentioned above enable organizations to realize the following key benefits:

- **Operational flexibility**: Each DR4000 can act as primary local backup as well as a target for remote replication. This enables two geographically distant sites to not only host local backups, but also to provide disaster tolerance to the other site.
- **All inclusive licensing**: Every DR4000 comes with all-inclusive licensing that allows users to use all the advanced features. The use of deduplication, compression, snapshots, link aggregation, and replication technologies make the DR4000 a very versatile disk-based backup appliance. When this is combined with the operational flexibility, organizations can immediately realize the benefits of implementing local backup protection and disaster tolerance with minimal investment.
- **Flexible configuration**: The per container policy settings for DR4000 enable system administrators to manage the replication of storage containers by balancing the times the data stores replicate and by adjusting the network load by using bandwidth throttling to match the unique disaster recovery priorities of individual organizations.
- **End-to-end inline deduplication**: The DR4000 implements advanced inline deduplication algorithms that process incoming data in local and remote deployments. This helps in meeting strict RTO and RPO objectives because all data transmitted is deduplicated during replication, requiring less bandwidth to transfer the deduped data.
- **Network Optimization**: By throttling network bandwidth and configuring time restrictions, WAN link usage can be optimized for the DR4000 to replicate data.

Summary

In summary, the DR4000 is an all-inclusive disk-to-disk backup appliance that delivers unmatched value in local and remote data protection. The advanced feature set when coupled with the licensing model enables organizations to quickly and easily deploy a deduplication- and compression-enabled backup and disaster tolerance strategy at minimal cost.