DELL EQUALLOGIC

STORAGE-BASED REPLICATION OPTIONS: SELECTING THE RIGHT REPLICATION METHOD FOR OPTIMAL DATA PROTECTION

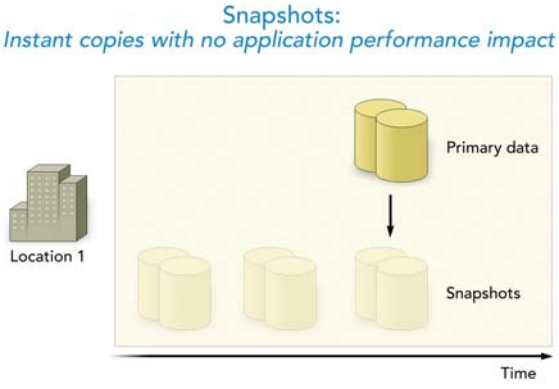
Snapshots make backup more efficient: they reduce downtime and work loss, while dramatically speeding up restore.

REPLICATION IMPROVES DATA PROTECTION

Backup is the core of data protection because it provides the ability to recover data from either physical disasters or common data corruption. Typically, companies back-up to tapes that are transported away from the primary data center and stored. But backup has drawbacks – regular disruption of production applications, long recovery time, and significant data/work loss.

Replication technologies were developed to shorten recovery time and minimize data loss, while reducing application disruption. The three key replication technologies are:

- Snapshots, or local point in time copies
- Remote point in time replication
- Continuous remote replication (synchronous or asynchronous)



SNAPSHOTS – LOCAL POINT IN TIME COPIES

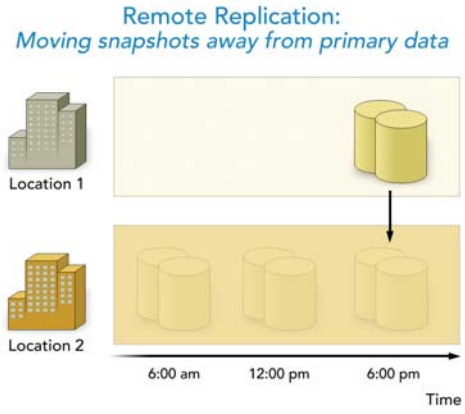
Snapshots make backup more efficient: they reduce downtime and work loss, while speeding up restore. Snapshots are image-based copies of application data, taken at a particular point in time while normal application operations and performance continue. Typically a full volume or set of volumes, snapshots are usually collocated and share storage with the original data. They take only seconds to create, minimizing application disruption. Since multiple snapshots can be maintained simultaneously, you can keep recovery points of 1 hour ago, 3 hours ago, yesterday, last week, etc. They can be maintained as differentials from each other, typically managed via copy on write mechanisms, or as complete copies, managed by breaking off a disk from mirrored disk sets. They deliver fast restore (since data is in a usable format and on disk) and reduced work loss (since the snapshot process can run more frequently than backup). Many organizations minimize downtime by backing up snapshots instead of primary data. They offer excellent protection from common failures (e.g., virus, software corruption, or accidental file deletion) because snapshots can be instantly restored back to the volumes from which they were created.

Remote replication is the most network and storage efficient method of replicating data.

REMOTE REPLICATION – REMOTE SNAPSHOTS

However, snapshots are vulnerable to physical disasters because they are collocated with primary data. Remote point in time replication solves this by replicating snapshots across a network to offsite storage. This method can be used for backup, delivers mul-

tiple recovery points, and protects data from common corruptions and accidents, as well as protecting data from physical destruction. Once a replica is created, subsequent replication operations transfer and store only the differences; if you write over the same block 100 times between replications, only the last change is sent over the network. Not only is this network-efficient, but replicas use less storage capacity while still providing complete volumes. Remote replication works with existing LAN, MAN, and WAN IP networks, including T1, T3, DS3, and OC* networks. As with snapshots, application recovery is fast, since databases and other application data are in clean, ready to run formats.



CONTINUOUS REPLICATION – DISK MIRRORS AT A DISTANCE

The two continuous replication methods (synchronous and asynchronous) are essentially extended RAID mirrors, offering a single recovery point. Production and remote sites typically must be within 100 miles (150 km) of each other, and they require costly low latency, high performance network links to support continuous writes with adequate performance. With continuous replication, each write executed on the production disk is executed on the remote disk as well. If the same block is written 100 times in an hour, each of those 100 writes is executed at both sites.

Both continuous replication methods offer up-to-the-minute protection against physical disasters. These options do not protect against common failures such as accidental file deletion, virus attack, or software corruption since a single recovery point of the production data is maintained the remote site. They are inadequate for backup because the data is not in application stabilized format.

KNOW YOUR REQUIREMENTS

Be certain that you understand your requirements before investing in a replication solution. Continuous replication offers physical disaster protection, but is an intermittent insurance policy. Snapshots are useful for fast recovery from onsite corruptions and errors, but don't protect from physical destruction of data. A broader solution is remote point in time replication which improves backup operations and offers disaster protection from all loss scenarios.

	Multiple Recovery Points	Distance from Primary Data	Recoverability	Improves Backup	Protects Against
Snapshot	✓		✓	✓	Common corruptions only
Continuous Replication		(some)	(some)		Physical disasters only
Remote Point in Time Replication	✓	✓	✓	✓	Common corruptions and physical disasters

This chart shows how the key business continuity requirements (number of recovery point copies, distance from production data, easy recoverability of data, backup improvement) are addressed by each replication method, as well as what protections each offers.

Remote replication works with existing LAN, MAN, and WAN IP networks, including T1, T3, DS3, and OC* networks.

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