



CLARiiON Disk Library Fits Right In To Backup

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Management Summary

Even as technologies evolve, the basic purpose of enterprise backup has remained constant. It ensures a redundant copy of data is available for a timely restore when data is corrupted, a system fails, or a disaster occurs. It really is a question of *when* such an event will occur, not *if*, and *whether* business operations will be interrupted or halted during it. **The time to recovery and resumption of business as usual depends on the quality of the backup and restore process.** It can take minutes, hours, days, or – heaven forbid – never, in the case of catastrophic data loss. The longer it is, the greater the cost imposed on the enterprise. Even though backup may be considered somewhat of a chore, it is essential and should be done well.

Backup's importance combined with other factors is fueling the growing interest in using disk as a backup target. Incorporating low-cost disk arrays into a backup environment can deliver several benefits:

- **Faster backups for meeting backup windows** – Disk has performance advantages over tape that provides breathing room for completing backups in the allotted time.
- **Faster restores** – This means IT applications and their associated business processes are up and running more quickly. It is difficult to overstate the value of timely recovery.
- **Reliability** – Disk also has inherent advantages over tape in handling media errors.
- **Minimized tape management overhead** – Disk is not displacing tape in backup, but rather complementing it. However, it means less data needs to be stored on tape, relieving some of the tape management load.

Aware of this trend, EMC recently introduced its own disk backup platform – the *CLARiiON Disk Library*. It consists of a CLARiiON midrange array with ATA disks and a front end that provides tape emulation and data compression. It scales to 58 TB of useable capacity (up to 174 TB compressed), 425 MB/s of aggregate bandwidth, and simultaneous emulation of 32 tape libraries and 256 tape drives. Fibre Channel ports provide connectivity to a SAN as well as a standard tape library for automatically moving data to tape.

A key benefit of the CLARiiON Disk Library is that it fits right in to existing backup environments through tape emulation – without changing software, applications, or processes. It is preconfigured and designed for fast installation and management through a GUI. As a result, it minimizes the hassle and risk of incorporating disk into an existing backup environment. Read on for details about disk-based backup and the CLARiiON Disk Library.

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Backup: The Spin on Disk and Tape Roles

It used to be straightforward: Disk was for primary storage and tape was for backup. If there was a problem with data corruption, a system failure, or a disaster, the IT department restored the primary data from tape. Tape provided a redundant copy of data to recover IT applications and keep their associated business processes up and running in the event of a problem.

While enterprises continue to use tape today, there is a major, growing trend to backup data to low-cost disk storage instead. Tape does not disappear from the scene, but it usually becomes a secondary tier for offsite and/or long-term storage of inactive backup data. A number of factors are driving this trend:

- **Data continues to grow** – This is a given, but it means more and more data must be backed up over an infrastructure that may not be able to handle it.
- **Backup windows missed** – More data to backup combined with production applications running longer hours (7 x 24, in some cases) mean it is increasingly difficult to execute all backup jobs in the allotted time. The result can be missed backup jobs, a common occurrence that exposes data to potential loss. The alternative is to run jobs into production hours, slowing applications and impacting productivity.
- **Low-cost ATA disk arrays are now available** – Enterprise arrays using ATA disks provide disk storage at a fraction of the price of high-performance Fibre Channel and SCSI disk arrays. They deliver a price/performance tier that fits comfortably in between primary storage and tape.
- **Disk-based backup and restore is faster and more reliable than tape** – The high bandwidth of a RAID array, its ability to read and write random, intermittent streams of data, and the avoidance of time spent loading and winding tapes make it favorable for backups and restores. While

both tape and disk media can fail, a RAID array by definition stores data redundantly, knows when a failure occurs, and allows a drive to be replaced and rebuilt in the background. With tapes, one does not necessarily know that a media failure exists until it causes a backup job to fail – or worse – a restore. RAID arrays also do not require the overhead of physical tape handling.

- **Tape still offers lowest-cost storage as well as portability** – While next-generation disk-based backup solutions present an attractive total cost of ownership (which factors both acquisition and operating costs), tape does deliver the lowest cost per unit of capacity, especially when storing very large quantities of data. It also has the advantage of removable, portable media.

In short, using low-cost disk as a backup target is gaining popularity because of its advantages in backup and recovery speed, management overhead, data availability, and media reliability. It allows enterprises to meet stricter requirements for data protection and business continuance. Tape still plays an important role in long-term archiving, remote storage, and additional redundancy. **Therefore, many advocate a combination of disk and tape for a tiered backup and restore infrastructure.** Typically, initial backups and most restores are from disk, and then data is copied or, eventually, migrated to tape, per policy.

CLARiiON Disk Library

The CLARiiON Disk Library is EMC's new solution for a disk-based backup platform that emulates a tape library. The appliance includes a CLARiiON CX300 or CX700 midrange storage array with ATA disks. The front end is a server running tape emulation and data compression (up to 3:1) software. The CLARiiON Disk Library can also connect to a standard tape library and facilitate a tiered storage architecture by automatically moving data from disk to tape for offsite storage, archiving, or additional redundancy. It interprets and executes the

backup application's commands for this action. The appliance is preconfigured and comes with a GUI for fast installation.

The CLARiiON Disk Library can scale to 58 TB of useable capacity and up to 174 TB compressed. The tape emulation engine has three 2 GB Fibre Channel ports for front-end connectivity to a SAN, four ports

to connect to the CLARiiON CX300 or CX700, and one for a physical tape library connection. An optional "standby" server is offered with the DL700 for even higher availability levels. The appliance looks and acts like a tape library to backup servers. It supports up to 80 MB/s per stream and an aggregate bandwidth of 425 MB/s. *See box on the left for technical details.*

CLARiiON Disk Library At A Glance

Key Features

Controller:	CLARiiON CX300 or CX700
Drives:	ATA 320 GB
Capacity:	12.5 TB / 37.5 TB compressed (DL300) Or 58 TB / 174 TB compressed (DL700)
Max bandwidth:	425 MB/s max
Front-end ports:	3 FC (2 GB)
Tape library ports:	1 FC (2 GB)
Max emulated libraries:	32
Max emulated drives:	256

Supported Backup Applications

- Veritas *NetBackup* and *Backup Exec*
- LEGATO *NetWorker*
- IBM *Tivoli Storage Manager*
- CommVault *Galaxy* (by Q3 2004)
- CA *ArcServe* and *Enterprise Backup* (by Q3 2004)

Supported Emulations

Tape Libraries:

- ADIC *Scalar Series*
- ATL *P-Series*
- STK *L-Series, 97xx Series*

Tape Drives:

- DLT, *SuperDLT*
- LTO, *LTO-2*
- STK *9840, 9940*

Note: The CLARiiON Disk Library can write to most of the same tape libraries and drives as it can emulate, except for the STK 97xx Series.

In addition to the benefits of disk-based backup listed above, the tape emulation capability of the CLARiiON Disk Library allows for seamless integration into an existing backup environment. There is no change to existing software, applications, and processes. IT departments are often risk-averse toward their backup infrastructure because it is so fundamental to business operations. Tape emulation allows enterprises to gain the benefits of disk-based backup while minimizing reconfiguration risks. While most backup applications can write directly to disk (apart from tape emulation), they require a number of changes, such as potential software upgrades, scripting changes, operator retraining, LUN management, and writing backups through file systems with their inherent size limitations. **When it comes to change in backup, many enterprises feel that less is more, so tape emulation lowers the hurdle for adoption.**

Conclusion

Many enterprises are turning to disk-based backup in response to data growth, stressed backup infrastructures, speedy recovery requirements, and management difficulties associated with tape. Low-cost ATA disk arrays are a key part of this new approach. **If you want an ATA backup solution from an established vendor with a long product history that can integrate seamlessly into your enterprise's backup environment, consider the CLARiiON Disk Library. It minimizes the risk of implementing disk-based backup.**



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