EMC Brings Cost Efficiency to Enterprise Storage – *CLARiiON with ATA* plus *SAN Copy*

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Management Summary

What if General Motors offered an option for the *Corvette* sports car that included a 4-cylinder engine instead of the usual, high-power V8? Such a model would still corner well, stop on dime, and impress the neighbors with its racy looks. **It wouldn't go as fast, but it wouldn't cost as much either.** Sports car purists may balk at the idea, but that's because they are mostly concerned with style and thrill seeking. If you transfer this idea to the realm of information storage, where sensibilities are more about pragmatism and getting the job done efficiently, it turns out to be a great idea that opens up a variety of possibilities.

In this spirit, EMC recently announced support for ATA drives (250 GB @ 5,400 RPM) in its *CLARiiON CX600* and *CX400* storage arrays. ATA is the disk drive equivalent of a 4-cylinder engine – not as fast or as robust as Fibre Channel (FC) or SCSI drives, but significantly less costly. CLARiiON's RAID, redundant hardware, and data integrity checks make it almost "industrial strength", and it is compatible with all of the CLARiiON software features like *SnapView* and *MirrorView*. Both FC and ATA drives can be combined in the same CLARiiON array to create an "in-a-box" tiered-storage solution – an innovative approach and industry first.

Furthermore, EMC introduced new heterogeneous data movement software called *SAN Copy*. It runs on a CLARiiON array and copies or migrates data between CLARiiON CX and FC (previous generation models) and Symmetrix DMX and 8000 models. It can also migrate data from HP *StorageWorks* arrays. As a source volume, SAN Copy can use point-in-time and snapshot copies as well as inactive production volumes.

ATA support, plus SAN Copy, opens the door for a number of storage applications, including:

- **Less-expensive replicas for new business continuance options** – Point-in-time copies and remote mirrors may not be new, but the lower cost to implement them with ATA certainly is,

- **Consolidated, disk-based backup and recovery** – For faster recovery, smaller backup windows, and less impact on application servers, and

- **Online archiving** – Bring archived data online for faster access and more productive workflows.

ATA disks are a promising technology, and IT departments will likely find even more uses for it in enterprise storage. It brings greater cost efficiency in areas suitable for its price/performance characteristics. **Adding ATA support to CLARiiON is a significant enhancement that will increase the attractiveness of EMC's line of mid-tier storage arrays.** Read on for more details.

CLARiiON with ATA

The *CLARiiON* family has a long history, dating back to 1997, as a "full-FC" storage array. This descriptor meant it supported FC host server connections and FC disk drives. **Now, its architecture can be described as "full-FC plus ATA" because the *CX600* and *CX400* models also support ATA drives (250 GB @ 5,400 RPM).** The FC host connections are the same, but the drives can be FC, ATA, or both in the same array. The raw capacity of an ATA CX600 with ATA is 58 TB. [1]

ATA drives open up a number of application possibilities by providing less-expensive capacity at a lower performance point than FC (*see sidebar on the right*). A drawer of ATA drives is about 75% less than a drawer of 146 GB FC drives. Keep in mind, however, that drives are only a part of the total system cost, which also includes storage processors, software, and maintenance. EMC engineered the ATA and FC drawers to be plug-compatible and, therefore, interchangeable within a CLARiiON CX system.

All of the CLARiiON RAID, hardware redundancy, data integrity, software, and management features apply to ATA drives. This even includes NAS support via the Celerra NS600 (Q2 availability). For each storage tier possible with a FC-only CLARiiON array by combining disks under various implementation schemes (e.g., RAID, mirroring, and snapshot), there are now twice as many tiering possibilities *in a single box* with the choice of FC or ATA drives.[2] Additional options for storage tiers allow enterprises to better optimize overall costs by more precisely matching data and quality of storage service delivery.[3]

SAN Copy

EMC also announced *SAN Copy,* a new CLARiiON-resident (CX600 or CX400) soft-

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[1] For technical reasons, the first DAE in an array must contain FC drives, but the others can be ATA.

[2] See *EMC's Storage Line Offers the Power to Choose* in **The Clipper Group Navigator** dated March 12, 2003, at www.clipper.com/research/TCG2003010.pdf.

[3] See *Tiered Storage Classes Save Money – Getting The Most Out Of Your Storage Infrastructure* in **The Clipper Group Explorer** dated August 29, 2002, at http://www.clipper.com/research/TCG2002030.pdf.

Fibre Channel vs. ATA Drives

FC and ATA drives occupy different points on the price/performance spectrum. The physical differences between them are performance, likelihood of failure, time to recover (since recovery is a function of performance), as well as cost.

FC drives are the high-power engines of the disk drive world. They are fast and highly available. Rotational speeds run from 10,000 to 15,000 RPM, enabling shorter seek times. These drives have dual 2 Gbps FC ports for fast data transfer and redundancy. Enterprise storage arrays, like the Symmetrix DMX and CLARiiON families, use FC drives to meet robust data requirements for critical applications. Think of these as the V8 and V6 engines of enterprise arrays, delivering high performance to different vehicles.

On the other hand, ATA drives are more like a standard 4-cylinder engine. They were first used in PCs and entry-level servers where high performance and reliability were not critical. The technology has matured over time, and it is now available in 7,200 and 5,400 RPM versions (slower rotational speeds typically mean more data can be stored and read from a disk, albeit more slowly). ATA disks are not as fast or robust as FC disks, but this may not be important for many applications. Data availability on ATA disks is protected by CLARiiON's RAID and replication features – the same value proposition EMC brought to the then SCSI drives in the early 1990s with Symmetrix. **The key feature of ATA drives is their lower cost, which makes it attractive for more price-sensitive applications, such as disk-based backup and archiving.**

FC and ATA drives are complementary. There are useful and appropriate places for both in a well-designed enterprise storage infrastructure. As always, it depends on the application.

ware feature that copies or migrates data between disparate CLARiiON CX and FC as well as Symmetrix DMX and 8000 storage arrays. SAN Copy can also migrate data from an HP StorageWorks array.[4] Source data can

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[4] Requires EMC professional services.

be a SnapView snapshot or business continuance volume (BCV = point-in-time copy), TimeFinder BCV, or an idle production LUN. It operates over short and medium distances with FC and uses FCIP for long distances. Unlike host-based replication solutions, it does not consume server CPU cycles or impact application performance.

New Applications Galore

CLARiiON's ATA drive support plus SAN Copy open the door to a variety of new applications. These may not be new in the absolute sense, but the lower cost profile of ATA may allow enterprises to do what they could not before:

- **Less-expensive replicas for new business continuance options** – Periodic snapshots or BCVs can protect against data corruption by allowing a database or file system to roll back to a known good state. They can also be used to re-purpose data for application testing or loading a data warehouse without impacting the production application. A synchronous remote mirror can provide failover in case of a local disaster. All of these business continuance options existed previously, but the magic of ATA drives is in lowering the price of entry so more enterprises can afford to do them.

- **Consolidated, disk-based backup and recovery** – The combination of SAN Copy and ATA can enable inexpensive, disk-based backup and recovery. For instance, data in multiple arrays could be periodically replicated to a centralized, possibly remote CLARiiON with ATA drives. A tape system could then backup the CLARiiON target for long-term archival and data portability. This approach delivers a much shorter backup window than tape, faster recovery, less downtime, less impact on primary storage and application servers, and more efficient use of tape media.

- **Online archiving** – Information that is infrequently accessed or consists of very large data objects (e.g., video, scientific data) is often stored offline in tape libraries due to the lower media cost. The downside is very slow data access and possibly manual intervention for retrieving and mounting tapes. By creating a tier of storage with a price/performance point in

between FC drives and tape, CLARiiON with ATA drives gives a good reason to consider putting at least some of this data online for fast, easy access. A higher service level can improve the productivity of the workflow processes that use the information.

This list is not exhaustive, and creative administrators will find other ways to apply CLARiiON's new cost-efficient technologies. It is also worth noting that EMC's *Centera* content addressed storage (CAS) solution[5] also uses ATA drives, but it offers a number of special features for long-term archiving that CLARiiON with ATA does not: guaranteed document authenticity, no data duplication, simplified access and retrieval of data objects, and tight integration with archiving and document management applications.

Conclusion

The low production cost of Henry Ford's legendary *Model T* opened the door for the "common man" to afford an automobile and made a big impact on society. **Like the Model T, ATA drives in a SAN-accessible array change the cost equation.** It creates an "in-between" tier of storage that can help optimize overall costs. ATA may not affect society on a grand scale, but it will certainly help enterprises keep up with rising data requirements in a more cost-effective manner.

CLARiiON offers significantly more value by supporting ATA drives and adding SAN Copy software. Enterprises can enhance the resilience of their data in ways that previously may not have been practical. They can also bring more data online for fast, convenient access and improved business productivity. In short, these enhancements are another good reason to consider CLARiiON. **ATA may lower the bar for data storage costs, but EMC has just raised the bar for mid-tier storage.**

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[5] See *Retrieving the Needle in the Haystack – EMC's Centera Manages by Content* in **The Clipper Group Navigator** dated May 20, 2002, at www.clipper.com/research/TCG2002017.pdf.

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