



Enhancements to IBM Shark Facilitate Comprehensive e-Business Continuance

Analyst: David Reine

Management Summary

With the Internet and the global economy, the requirements of enterprises, especially e-businesses, for non-stop data access have never been greater. In addition, as recent events have proven repeatedly, **disasters, both natural and man-made, have placed requirements on IT for levels of disaster recovery (DR) that are beyond previous contemplations.** Some of these requirements have been established for sound business purposes to simply keep the enterprise operational; others have been imposed by state and federal regulations to ensure that an auditable trail of information is available. In either case, **business continuance demands the ready access to enterprise data.**

The issue is one of time, or not enough time, to be more specific. In a 24x7 e-business day, there is little free time to backup to tape or send duplicate files to a remote location. Even if there was enough time to back up everything required, and move it to a remote site, in the case of a disaster, it may take more time to restore than customers could tolerate. This can be the killer of lost opportunity costs. **If you cannot recover quickly and darn close to where you were when the outage occurred, you are likely to be out of business.**

Disaster recovery is more than a technical solution though; it is a business solution. The need to recover quickly from a local outage is a prerequisite to enterprise health. However, **disaster preparedness does not come without cost, in terms of duplication, synchronization and management, especially for a dynamic e-Business requiring continuous operation.**

Preservation of the current state of enterprise data is a baseline requirement for business continuance. Having it loaded and ready to go remotely is no longer a luxury at many enterprises. The question is how to do it, which boils down to a question of risk tolerance and the value of softening the risk.

To facilitate preparedness, IBM recently announced enhanced functionality for its *TotalStorage Enterprise Storage System 800 (ESS, a.k.a. Shark)* high-end arrays. Read on to find out how these enhancements improve duplication, synchronization and management of remote data.

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Understanding Your Choices

In the perfect world, you would only need to protect against technical failure (of hardware and software products), human error, and corruption. With respect to storage, the industry has come a long way in protecting against technical failure (by mirroring and RAID), human error and corruption (by frequent point-in-time copies and application logs, and by firewalls and anti-virus software). However, this is not a perfect world. **Enterprises also need to be concerned about local disasters, whether man-made or natural.** If your array or, worse, your data center is seriously disabled, you need to have a reasonable *Plan B*.

For larger enterprises, this, typically, is another array that is mirroring the primary array, either synchronously or asynchronously. Tape usually will not be sufficient, because too much data would have to be restored, and, these days, time is the most valuable commodity to running a business. If you take tens of hours or days to restore to another data center, then you have lost a lot of business or you may be out of business.

The first question is where to put the remote array. While you could put it in the same room, or even the same building, that would not provide much protection against a location disaster. The economics of storage technology provides some guidelines. Without repeaters to extend cable distances, Fibre Channel-connected remote arrays need to be within 40 kilometers of the main array. Therefore, you might have the main data center in New York City and a backup data center across the river in New Jersey. With extenders, this distance can be doubled, or more, and still allow for synchronous operation, i.e., to allow for the system to make simultaneous updates to both arrays, with only a little delay due to the distance. This allows for a speedy recovery, if the primary array goes down.

Unfortunately, 40 or even 100 kilometers is not enough to protect against many natural or terrorist disasters. A hurricane coming up the east coast could hit both New

York City and neighboring New Jersey. So, to be really protected, you need to go much further, maybe 1500 kilometers. This requires different technologies to traverse that much greater distance. In the past, and at great expense, T3 telephone lines were amalgamated to build a data highway to span that distance. Today, some enterprises are using IP networks to send files and databases to remote locations.

What you want is a “have your cake and eat it too” situation. You want the additional array within your facility, or campus, to give you the speediest recovery with the least (or no) data loss. You also want to protect your enterprise with a distant third array, but maybe with a little more risk of data loss to offset the great unlikelihood of losing two arrays at the same time. None of this is cheap, by any means, but neither is any other kind of insurance that provides real protection.

New Enterprise Storage System Enhancements

IBM recently announced a number of enhancements to make this possible on their *Enterprise Storage System (ESS) Model 800*¹:

- **Extensions to the duplication capability** via new functionality for *FlashCopy*'s copy service capability, with new, more flexible and efficient utilization of resources which offer unparalleled information accessibility;
- **Enhancements to the remote synchronization capability** via a new release of *Peer-to-Peer Remote Copy (PPRC)* using Asynchronous Cascading to offer a complete, consistent, and coherent copy of data at a remote site in case of an unplanned outage; and
- **Creation of a more flexible vehicle to meet increasing and**

¹ Popularly known as a member of the *Shark* family of IBM high-end storage arrays.

continuing demands for more storage, using *Capacity Update on Demand (CuOD)*.

File Duplication

In order to satisfy the demands of e-business for more copies of files and databases for a multitude of uses (including business intelligence, data sharing, and backup), **IBM has released a new version of FlashCopy specifically designed to improve the efficiency and the flexibility of file duplication.** Some of the major enhancements of this new version include:

- Reduction of the time to set up a point-in-time copy by a factor of 10;
- Enabling the copying of a z/OS or OS/390 data set within a volume, rather than copying the entire volume;
- Incremental Refresh, which enables the refresh of only the changed data from source to target. This feature also allows the direction of the refresh to be reversed, with the target becoming the source;
- Enhancements of data set granularity so that source and target volumes do not have to be the same size or can be, in fact, the same volume. It also enables one source to have multiple targets, to provide a broadcasting capability. It also extends the FlashCopy capability to the *zSeries* environment enabling mainframe customers with the capability to make point-in-time copies of individual data sets.
- Consistency checks that defer the completion of a write I/O until all targets receive the I/O. This enables the creation of a consistent point-in-time copy across multiple volumes with a minimum system overhead

These features all improve the granularity, flexibility, scalability, performance, and capacity utilization of the duplication facilities within the continuous operations functionality of the ESS 800.

Remote Synchronization

IBM has also released a new version of Peer-to-Peer Remote Copy (PPRC) designed to enable asynchronous cascading between servers. This feature provides long-distance remote copy solutions for both zSeries and open systems servers. It also enables the cascading of three separate ESS systems, with the target of the primary array becoming the source for a third array (hence, the cascading concept). With the first two arrays connected synchronously, if desired, the second and third arrays can communicate over long distance, asynchronously, over an IP network. This provides a complete, consistent, and coherent copy of data at a remote site, in case of an unplanned outage at the local site.

New Storage Management Capabilities

IBM has also announced a new offering for the Capacity Upgrade on Demand capability previously announced for Shark. With this capability, you can install ESS systems with up to 6.9TB of additional unused disk capacity, held in reserve as excess (available) capability, ready for activation to help address rapidly changing business needs. This enables the non-disruptive activation of required disk capacity without physical intervention. This available disk capacity can be added for a minimal convenience charge of 10%. The added capacity to be paid for when it is activated.

Conclusion

With these new features, IBM has introduced point-in-time and remote copy features that improve the disaster recovery capabilities of its Enterprise Storage Server. These improvements also reduce the pressures of unplanned storage growth via CUoD. **Consider the ESS 800 as your vehicle to meet the difficult demands for enterprise storage in an unpredictable, on-demand world.**



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- ***The Clipper Group can be reached at 781-235-0085 and found on the web at www.clipper.com.***

About the Author

David Reine is a Senior Contributing Analyst for the The Clipper Group. Mr. Reine specializes in enterprise servers, storage, and software, strategic business solutions, and trends in open systems architectures. He joined The Clipper Group after three decades in server and storage product marketing and program management for Groupe Bull, Zenith Data Systems, and Honeywell Information Systems. Mr. Reine earned a Bachelor of Arts degree from Tufts University, and a MBA from Northeastern University.

- ***Reach David Reine via e-mail at dave.reine@clipper.com or at 781-235-0085 Ext. 37. (Please dial "1-37" when you hear the automated attendant.)***

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