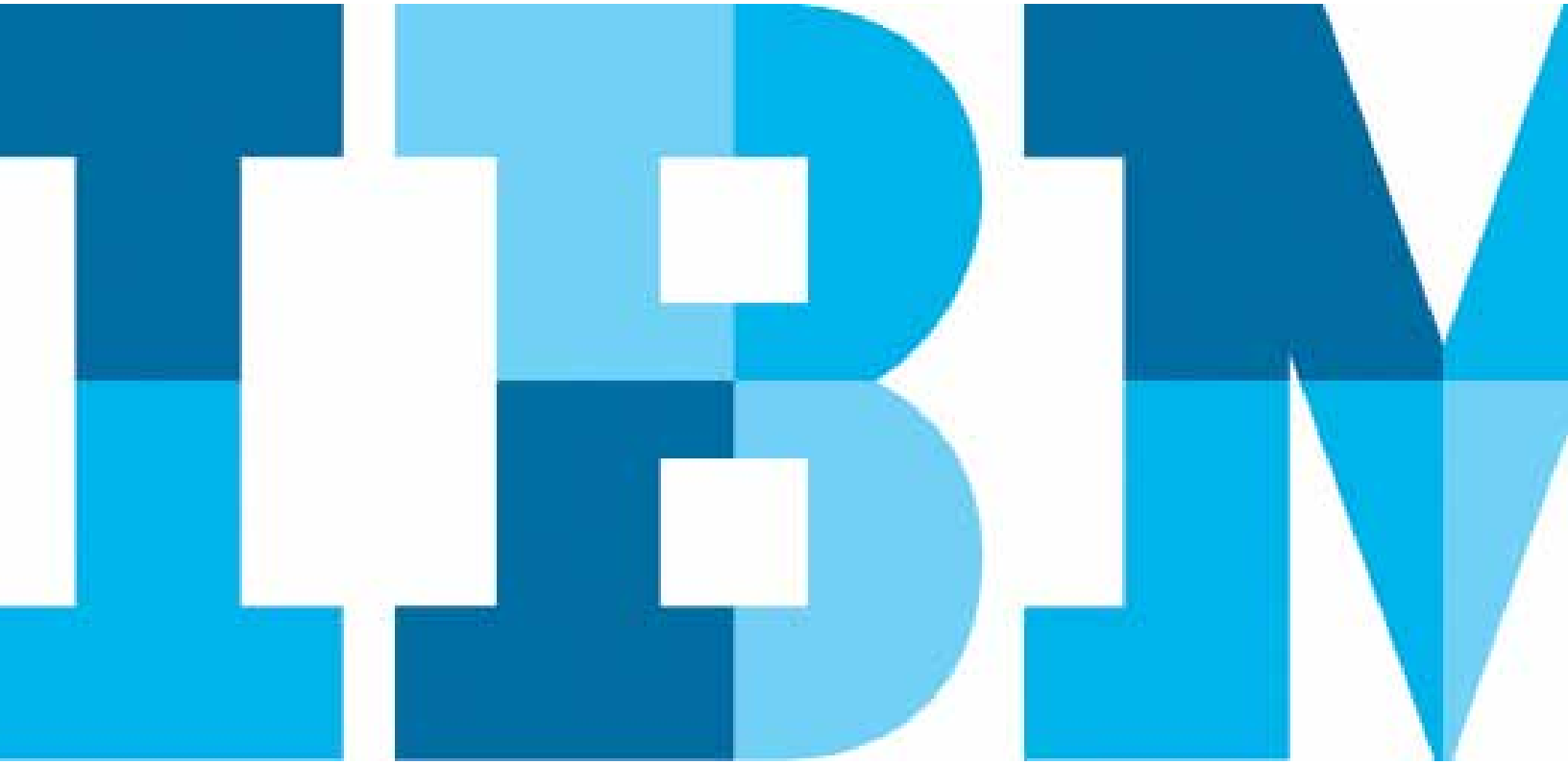
IBM Systems and Technology Group
Thought Leadership White Paper

April 2013

Accelerating eCommerce with IBM FlashSystem



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You can differentiate yourself from your competitors by helping customers get to the best data faster. However, to do this, your users need access to search and view available inventories *at the same time* that you are updating the items in your database. With the increasing competitive nature of online eCommerce, this real-time inventory and online assistance is becoming a staple in online service. As services and features of your online retail shop, the data demand in speed and breadth of data continue to increase the pressure against the IT infrastructure. I/O constraints and bottlenecks on your existing storage platform can start to negatively impact the responsiveness of your website.

Today, the pool of users is growing fast and they are demanding more responsive websites. To stay competitive, you need to reduce storage access latency and increase performance for both read and write access and improve user response experience. If your customers cannot access the information they need in real time they will go elsewhere.

I/O bottlenecks due to slow disks

Heavy transactional database applications have "hot" content that give rise to delays in I/O performance. The application demands data faster than the storage is able to deliver it, causing excessive CPU cycle demands on the storage controllers and diminishing user responsiveness by the application. The latency between a database and an existing hard disk-based storage array can cause performance bottlenecks that frustrate your customers.

Even if your database application is optimized for performance, you might find that your performance bottleneck is in the inability of your RAID storage system to access data quickly enough.

Hard disk drives are now too slow. Traditional hard disk based systems incur a performance penalty because of the high access times of hard disk drives. Access time is the time it takes for a request for data to be sent and completed. The fastest hard disk drives have peak performance access times of only 5 milliseconds.

Additional hard disks are installed to increase the scale of performance, but adding hard disks does not improve access times. You cannot resolve this latency bottleneck by expanding the storage system and adding more hard disk drives (HDD). To better the end user experience, a new technology is required.

Conventional hard disk drives cannot deal with simultaneous high-demand read and write access requests. Databases that are heavy in both read and write access need performance that hard disk drives just cannot deliver. Again, adding more disks has been the traditional solution, despite the increasing cost of each stored bit. Anytime you have to add excessive resources to resolve an issue, there is likely a more economical approach. Adding excessive capacity through additional disks is not the most economical approach in resolving the scalability of your online presence nor does it better the end user's online experience.

Improve performance with flash storage

Fundamentally, applications and their users do not know what technology is storing the data. The only insight we have to storage is how long we have to wait for the data requested. With the performance gap between processors and hard drive-based storage systems widening, flash storage is entering the limelight. Since flash storage systems rely on memory chips for data storage, they offer unprecedented access times that narrow the gap between the processor speeds and storage speeds. Processors have evolved over 100 times in processing potential in the past 10 years while storage response times of spinning disks have stagnated and have only increased storage capacities. Flash storage recovers the lapse in I/O performance of the last 10 years. Newer flash systems have become increasingly sophisticated, higher performing and lower cost, which sends a clear message … there is no better tool for improving I/O performance.

Flash is a non-volatile storage media that stores data electronically so it performs at much higher speeds and is more power and space efficient compared to traditional, mechanical hard drives. These speed increases are in both response times and scalability.

IBM® FlashSystem™ storage

By removing the latency of moving parts, flash storage systems present access times of less than 100 microseconds, over 50 times faster than HDD.

In typical capacity scenarios, only parts of the corporate dataset are "hot" and require frequent access. Databases, with indexes and structured table data, are stored on the FlashSystem storage, while the remainder of the data is stored on your existing conventional hard disk arrays. This tiered storage approach will give you the ability to scale to significantly higher loads without impacting response time. After shifting the critical application workload to flash systems, our customers report that this technique also resolved the workload of less critical apps as there is no longer the contention between the workloads. Most importantly, the load on their database increased significantly while response times stayed flat and deterministic.

FlashSystem storage systems ensure both speed and reliability in accessing data. As hardware-based, FlashSystem delivers exceptionally low response times to applications to ensure the best processing efficiency and end user experience. The scalability of increasing the users or workload is also in place for further revenue growth. Identifying the workloads that are the most business critical and benefit the most from higher performance, when moved to FlashSystem storage, relieve the incumbent infrastructure to bring benefit to all application units.

Best yet, because FlashSystem storage is interoperable through traditional SCSI and Fibre Channel protocols, expensive and time-consuming application changes are not necessary to recover the lost time previously wasted on I/O. Applications will always require data and that data should be as quick as possible to avoid waiting on the processors and, more importantly, the users. Storage performance is a Race to Zero Latency.

Conclusion

To maintain your competitive edge in eCommerce, you need to handle increasing numbers of users and their increasing demands for data access and without compromising each individual user's experience. Hard disk drives cannot deliver the "hot" files fast enough for your demanding customers. Flash storage delivers increased performance by dramatically reducing the latency of the storage. The fast access times of FlashSystem allows "hot" data to be served quickly—satisfying clients with the best user experience while freeing up processors for other value-added features to stay ahead of the competition.