alibris

CASE STUDY

Alibris Throws the Book at Sluggish Searches

Book eRetailer dramatically improves search and inventory processing speeds by using SanDisk® Fusion ioMemory™ ioDrive® cards to re-architect its systems.

Summary of Benefits

- Eliminated queuing on inventory database, ensuring customers viewed most up-to-date data
- 6x faster searches improved customer satisfaction, conversion, and retention
- Eliminated SAN maintenance from its search system
- Enabled a new architecture that eliminated need for applications to share resources
- Eliminated burden that inventory and search application placed on SAN

The Challenge

Alibris is the premier online marketplace for independent sellers of new and used books, music, and movies, including rare and collectible titles. It views its site as a community where customers can meet and share their interests.

Alibris maintained a SAN accessed by multiple applications. Its inventory processing and full text search applications were hosted on a single Oracle OLTP server. This created contention for resources that resulted in the following problems:

1. **Slow searches.** Slow searches threatened customer conversion, retention, and overall satisfaction. Alibris needed to greatly improve search response times.
2. **Slow inventory processing.** Because the inventory application competed for resources with the search application, deep transaction queues formed in Alibris's Oracle database. With 3-5% of its 140 million SKU (stock-keeping unit) inventory turning each day, these queues created a risk that customers might view stale data, which had drastic implications for Alibris's business. For example, a customer might see an out-of-stock item as still available or not see a recent price drop that, in today's competitive online marketplace, could result in a lost sale.

John Shearer, Director of IT, wanted to separate the two systems, but faced two constraints. First, the SAN was already overloaded and would require an upgrade far beyond Alibris's budget. Second, full-text searching required access to the latest inventory data. This ruled out a separate disk-based server as replication latency would be too high.

SanDisk to the Rescue

After some research, Senior Operation Engineer, Michael Warchut, and team deployed SanDisk's Fusion ioMemory solution to see if it could deliver the low-latency replication that would enable Alibris to move its full-text search application to a separate machine. He purchased a primary and a failover server, equipping each with a pair of 320GB Fusion ioMemory ioDrive cards. He then installed the search application and replicated the inventory database to the new servers. The results were better than he hoped.

The Payoff

Michael told us, "The ioDrive cards made it possible for us to operate with absolutely no discernable replication latency."

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"Previously, any searches that had to go back to disk frequently resulted in a lost sale. Now we cache all data in either RAM or SanDisk. Search speeds have improved over six times, eliminating slow response as a cause of customer abandonment."

John Shearer,
Director of IT

This rapid replication meant that the full-text search application would reflect the most current data in the inventory database. It also meant that the inventory system would no longer be competing for resources and would suffer far less from queuing. Price and product availability status changes propagated instantly; customer support jettisoned an entire subset of tickets brought on by stale data.

Supercharging Searches

The SanDisk-powered solution did more than just enable Alibris to split the systems—it also greatly improved search performance. Customers could now quickly run complex searches over 140 million SKUs without experiencing slow page responses that used to threaten conversion and retention.

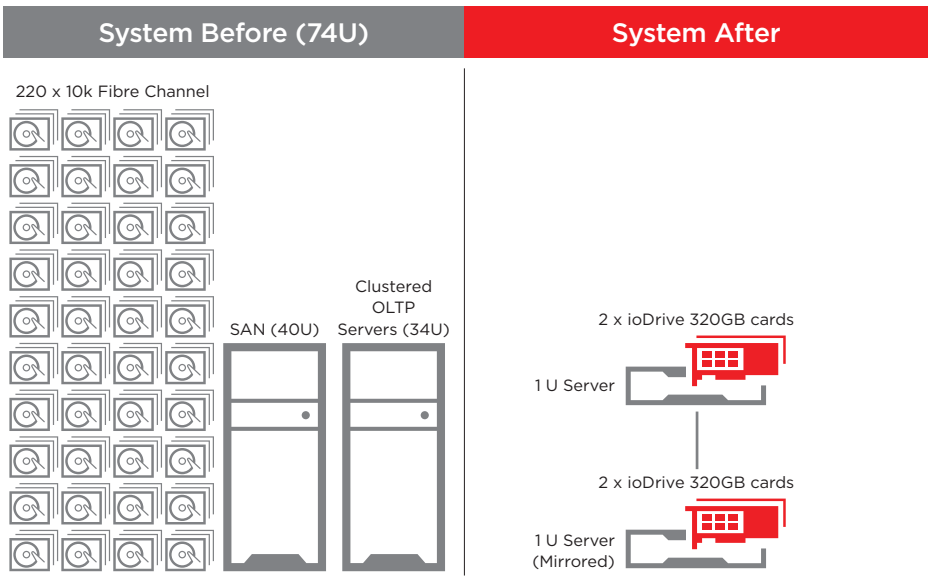
"Previously, any searches that had to go back to disk frequently resulted in a lost sale. Now we cache all data in either RAM or SanDisk. Search speeds have improved over six times, eliminating slow response as a cause of customer abandonment," John said.

A Smarter and Stronger System

By moving its search application to two servers and four ioDrive cards, Alibris improved many other areas of its business.

- First, since its inventory processing system no longer had to compete with resources, it no longer suffered from deep queuing.
- Second, in addition to improving search performance, it also gained three to four times its previous capacity. This gave the search system significant room for growth.
- Third, it removed the SAN from its search layer, eliminating SAN upkeep and maintenance from its search system overhead.
- Finally, Alibris reduced the load its search and inventory applications placed on its already overburdened SAN—delivering a positive ripple effects for other applications that used it.

Changes to the Search System



- (2) 17U clustered servers, 16 processors, 64GB RAM
- OS: Unix
- Application: Oracle 11GR1
- SAN (40U)
- Hard disk: 220 x 10k Fibre Channel drives

- (2) Sun X4170 8 processor cores, 72GB RAM (1U)
- 2 x 320GB ioDrive cards

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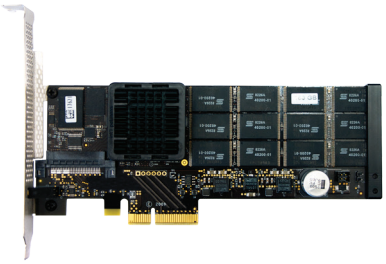
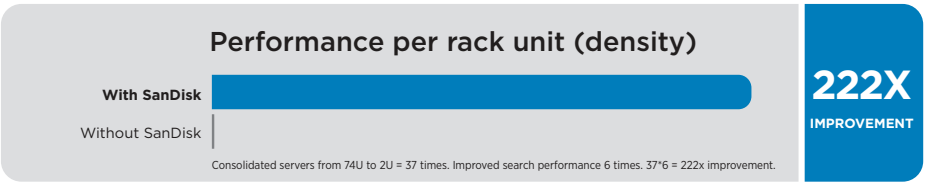


Fusion ioMemory™ - ioDrive®



Summary

Implementing the Fusion ioMemory solution gave Alibris the following benefits:

- Eliminated queuing on inventory database, ensuring customers viewed most up-to-date data
- 6x faster searches ensured customer satisfaction, conversion, and retention
- Eliminated SAN maintenance from its search system
- Enabled a new architecture that eliminated need for applications to share resources
- Eliminated burden that inventory and search applications placed on SAN

John is thrilled with their SanDisk powered system. When a co-worker asked if he was happy, he responded, "We are very happy with them. Have you ever hired a general contractor who gave you a bid and a time frame, then did the work exactly as promised? Me neither. But that's what SanDisk did for us."

About the Customer

Alibris (pronounced "uh-LEE-briss") is the premier online marketplace for independent sellers of new and used books, music, and movies, as well as rare and collectible titles. It connects people who love books, music, and movies to more than 100 million items from thousands of sellers worldwide. Its parent company, Monsoon Commerce Solutions, also helps sellers and retailers grow their sales through marketplace services and selling solutions.

Since launching in November 1998, it's grown to be the Internet's largest independently owned and operated marketplace. That's more than ten years of doing the following:

- Supporting thousands of independent sellers
- Providing customers with our sellers' great prices and unbeatable selection
- Giving customers the peace of mind of its proven track record of satisfying customers

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At SanDisk, we're expanding the possibilities of data storage. For more than 25 years, SanDisk's ideas have helped transform the industry, delivering next generation storage solutions for consumers and businesses around the globe.

The performance results discussed herein are based on internal Alibris testing and use of Fusion ioMemory products. Results and performance may vary according to configurations and systems, including drive capacity, system architecture and applications.