



First Rate Improves Processor Utilization Four-Fold; Expects Complete ROI Within 6 Months

Summary of Benefits

- **Eliminated** application slowdown, improving customer experience
- **3x faster** to complex business intelligence jobs
- **Expect full ROI** in just six months
- **Easily implemented** drop-in solution
- **Repurposed** two vaults for storage

The Challenge

First Rate allows investment companies to outsource their business intelligence and generate high-quality reports based on that analysis. They operate in the financial industry, where the phrase “time is money” has very real implications. So when their middleware servers began to bog down, they acted quickly.

After-hour processing was taking far too long, extending into the morning hours. As clients began using the application, system performance worsened. As a provider of top-tier business intelligence, First Rate found this performance unacceptable to themselves and to their clients.

Steve Schneider, First Rate’s network administrator, analyzed their system and found that their reporting server’s primary problem was poor I/O. Evidence of this included a high disk queue, showing the processor was waiting on the hard disk, and a dismal processor utilization of 50%. Additionally, the system suffered from major disk thrashing in the morning, when the after-hours processing and the reporting application began competing for I/O, forcing the system to switch between operations.

Recognizing that they had to somehow improve processor utilization, Steve implemented a short-term but inadequate stopgap of a 1TB PE220s vault as he looked for a long-term solution. While a SAN might provide the necessary performance, such a solution was cost prohibitive. Alternate solutions that fit into their budget (such as software based RAM Disks utilizing the on-board RAM DIMMs) were unstable. After reading an article about SanDisk® Fusion ioMemory™ solutions on an online hardware site, he was stunned at the performance gains other companies were experiencing and decided to give some Fusion ioMemory ioDrive® cards a try.

The SanDisk® Solution

First Rate’s middleware environment consisted of four front-end Information Builder WebFocus reporting servers and two Microsoft SQL database servers. The core investment analysis was performed on the front-end servers by the WebFocus application, so Steve decided to focus his efforts on improving the front-end server performance.

Knowing that the SanDisk solution was designed to improve application I/O, Steve decided to test moving the files that experienced the highest I/O onto ioDrive cards. These files were WebFocus’s Edatemp files.

First Rate ran benchmark tests with the Edatemp files located on three different storage media:

- 5-drive PE220s Vault with U320 SCSI 15k 73GB Drives. (First Rate’s existing system—each vault contained the Edatemp files for two reporting servers.)
- Local SAS 2-drive (RAID1) configuration.
- ioDrive cards configured for optimal write performance.

“We are thrilled with the way ioDrive cards allow us to offer our clients unparalleled performance. We expect a full return on our investment within six months.”

Steve Schneider,
Network Administrator
First Rate

Each test ran forty WebFocus agents against 46,000 accounts (all accounts flagged daily) on two months worth of data and generated 139 million Unit Value Returns (UVRs).

The Results

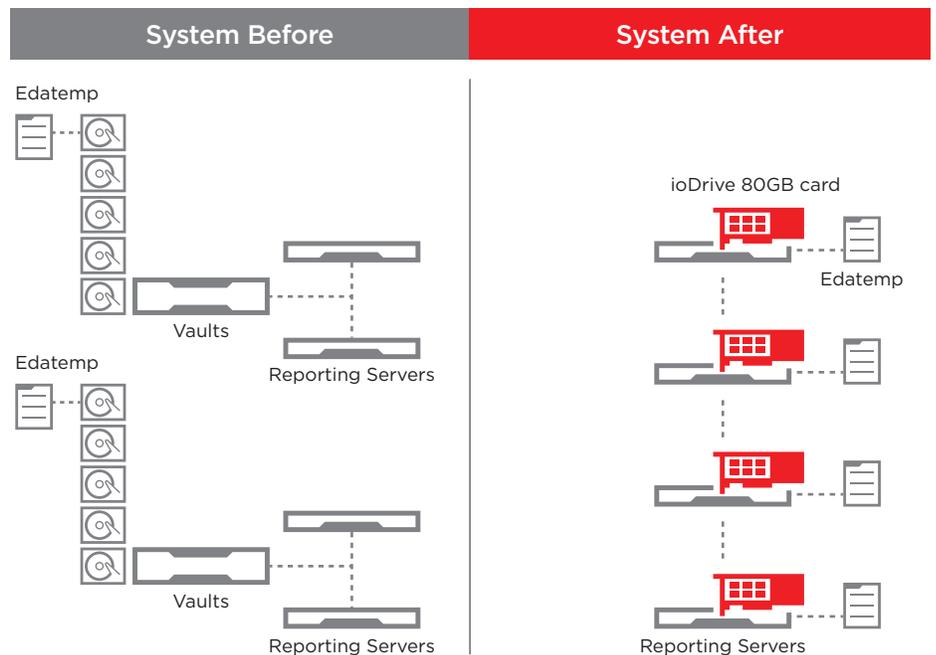
Just one ioDrive card on each reporting server (for a total of four) improved processor utilization four-fold, allowing First Rate to do three times the work in the same amount of time. It also allowed Steve to repurpose the vaults for more standard storage uses. The results of the test are shown below.

Edatemp On	CPU Utilization	Time for Completion
PE220s Vault	50%	4:22 hours
2-drive SAS RAID	50%	4:30 hours
80GB ioDrive cards	90-100%	1:30 hours

The ioDrive cards' performance allowed First Rate's after-hours processing to complete on time, their application to perform at top speeds, and most importantly, it allowed their clients to manage their investments without slowdown.

Steve had the following to say about the results, “We are thrilled with the way ioDrive cards allow us to offer our clients unparalleled performance. We expect a full return on our investment within six months.” He is now planning to test Fusion ioMemory products on First Rate's databases.

System Overview

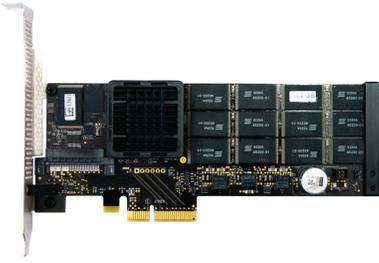


Four reporting servers (1U each)

- 1U Server, Quad/Dual processor with 4GB RAM
- OS: Windows Enterprise Server R2
- Server Software: WebFocus 7.6.7, ReportCaster 7.6.7, First Rate Performance 6.0
- Disks: Two 15,000 RPM SAS drives in a RAID1

- Decommissioned both vaults
- Added one 80GB ioDrive card to each reporting server (for a total of four), moving the Edatemp files to the ioDrive cards

One 3U 1TB PE 220s Vaults for every two reporting servers (Edatemp files on the vault)



Fusion ioMemory™ - ioDrive®

Performance per Rack Unit (Density)

With SanDisk
Without SanDisk



7.5X
IMPROVEMENT

Consolidated servers from 10U to 4U = 2.5 times. Improved job processing from 4.5 to 15 hours = 3 times.
2.5 * 3 = 7.5x greater performance density.

Summary

The Fusion ioMemory solution delivered the following benefits to First Rate.

- **Eliminated application slowdown**, improving customer experience
- **3x faster** complex business intelligence jobs
- **Expect full ROI** in just six months
- **Easily implemented** drop-in solution
- **Repurposed** two vaults for storage

About First Rate

First Rate® provides investment performance measurement and analysis solutions to the wealth management industry. The First Rate Performance Solution allows investment firms to calculate accurate rates of return, better analyze the results efficiently and generate dynamic “boardroom quality” presentations for their clients. As a trusted advisor, First Rate provides its customers with a level of focus, depth and expertise that is truly unique to the industry.

Contact information

fusion-sales@sandisk.com

Western Digital Technologies, Inc.

951 SanDisk Drive
Milpitas, CA 95035-7933, USA
T: 1-800-578-6007

Western Digital Technologies, Inc. is the seller of record and licensee in the Americas of SanDisk® products.

SanDisk Europe, Middle East, Africa

Unit 100, Airside Business Park
Swords, County Dublin, Ireland
T: 1-800-578-6007

SanDisk Asia Pacific

Suite C, D, E, 23/F, No. 918 Middle
Huahai Road, Jiu Shi Renaissance Building
Shanghai, 20031, P.R. China
T: 1-800-578-6007

For more information, please visit:

www.sandisk.com/enterprise

SanDisk®

a Western Digital brand

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 First Rate testing and use of Fusion ioMemory products. Results and performance may vary according to configurations and systems, including drive capacity, system architecture and applications.

©2016 Western Digital Corporation or its affiliates. All rights reserved. SanDisk is a trademark of Western Digital Corporation or its affiliates, registered in the United States and other countries. Fusion ioMemory, ioDrive, and others are trademarks of Western Digital Corporation or its affiliates. Other brand names mentioned herein are for identification purposes only and may be the trademarks of their respective holder(s).