



WHITE PAPER

# Fusion ioMemory™ Solutions for Search Environments: FAQ

**SanDisk®**  
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**Q: What are the benefits of using the Fusion ioMemory platform in my search environment?**

A: The Fusion ioMemory platform increases search application performance with a persistent, high-performance, high-capacity memory tier that delivers terabytes of memory per server. These systems are fast, reliable, easy to implement, and cost-efficient.

**Q: How do Fusion ioMemory solutions save on system costs?**

A: Fusion ioMemory solutions increase memory performance in servers instead of pooling expensive DRAM across several servers. It handles large workloads with less rack space. For example, Japanese Internet service provider, Rakuten, used Fusion ioMemory products to eliminate over 50% of its Microsoft FAST environment's existing rack space, replacing a few hundred 2U servers with 5% fewer 1U servers. Fusion ioMemory solutions also provided significant performance headroom to defer future scaling needs. Overall, the Fusion ioMemory implementation beat Rakuten's closest competitive bid by over \$4 million.

**Q: What search platforms are Fusion ioMemory solutions compatible with?**

A: Fusion ioMemory solutions are compatible with all block-based search applications, including Microsoft FAST, Autonomy, and Lucene.

**Q: How will Fusion ioMemory solutions help my search system?**

A: Fusion ioMemory solutions' persistent memory tier reduces time for concurrent search and index optimization, and warms up servers in a fraction of the time. It dramatically reduces latency by integrating directly with the CPU, providing a more direct path for data. Its high bandwidth reduces performance impact during index merging and completes automated searches on time, under any load. With Fusion ioMemory solutions, searches achieve high performance and relevance even with growing data sets.

**Q: Are Fusion ioMemory solutions difficult to implement?**

A: Fusion ioMemory products are drop-in solutions that assimilate quickly and painlessly with block-based search applications. Once system administrators install the Fusion ioMemory ioDrive® cards into the server, they can choose to place indexes, temp files, logs, and/or active data onto the ioDrive devices.

**Q: Is Fusion ioMemory technology reliable?**

A: Fusion ioMemory solutions maintain a predictable and stable workload while storing data on persistent media. In-flight data is protected with end-to-end parity. Data-at-rest is continuously scanned and, when necessary, rebuilt. Adaptive Flashback® protection offers chip-level redundancy that recovers data instantly and without loss in performance or capacity.

**Q: How do Fusion ioMemory products affect the reliability of my search system?**

A: In addition to their own enterprise reliability features, Fusion ioMemory products improve search system reliability by reducing server footprint. This makes systems much easier to manage and greatly reduces the number of failure points, spinning disks, network cables, and switches.

**Q: Can I achieve real-time search with Fusion ioMemory products?**

A: Yes. Fusion ioMemory products reduce time for concurrent search, index optimization, and latency, enabling users to achieve near real-time search by committing and optimizing their indexes continuously. Documents become visible seconds after being added.

**Q: How do Fusion ioMemory solutions enhance indexing?**

A: Fusion ioMemory solutions provide consistent low latency to search systems, creating a predictable workload even for large indexes. High bandwidth guarantees performance during index merging. Customers can optimize indexes more frequently, improving overall search performance, even for workloads that constantly handle hot data.

**Q: How is Fusion ioMemory technology better than RAM-based indexes?**

A: RAM-based indexes suffer from three disadvantages:

- Data stored in volatile, instead of persistent, media
- Adding RAM could require upgrading to more expensive servers
- Adding large amounts of RAM degrades OS performance

Fusion ioMemory solutions have no moving parts, making it a nonvolatile and persistent media for data. Because Fusion ioMemory solutions reduce the amount of RAM that each search server needs, expensive upgrades become unnecessary—system architects will never need to add shelves of performance storage. With Fusion ioMemory products, indexes have room to grow without adding cost.

**Q: How do Fusion ioMemory solutions affect my search system maintenance?**

A: Fusion ioMemory solutions dramatically lower system maintenance. Because Fusion ioMemory solutions achieve such high performance, search systems need fewer servers, hard-disks, and rack space, which in turn eliminates failure points for a more reliable and easy-to-maintain architecture overall.

In addition, Fusion ioSphere™ software provides easy monitoring and management of all Fusion ioMemory devices from a single interface in real-time.

**Q: Why should I choose Fusion ioMemory products over RAID for my search application?**

A: Tests performed by Microsoft on its FAST search server show that Fusion ioMemory products extend more queries per second before latency impact than RAID disk-based systems. Lucene benchmarking also shows that Fusion ioMemory solutions provide five times faster search completion than spindle-based RAID 0, with Fusion ioMemory solutions reaching between 7,000 and 14,000 search requests per second.

**FOR MORE INFORMATION**

Contact a SanDisk® representative, 1-800-578-6007 or [fusion-sales@sandisk.com](mailto:fusion-sales@sandisk.com)

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

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