

OPTIMIZE MICROSOFT APPLICATION PERFORMANCE WITH EMC UNIFIED STORAGE

What if you could automatically fix performance bottlenecks within your critical Microsoft applications?

THE BIG PICTURE

With EMC FAST and FAST Cache you can:

- Execute a cost-effective tiering strategy without manual intervention
- Reduce total cost of ownership by intelligently utilizing Flash and SATA drives
- Provide the most efficient balance of performance and cost savings in Microsoft environments

Maintaining high performance is a top concern for companies that rely on critical Microsoft® applications and databases like Exchange Server 2010, SharePoint® 2010, and SQL Server® 2008 R2.

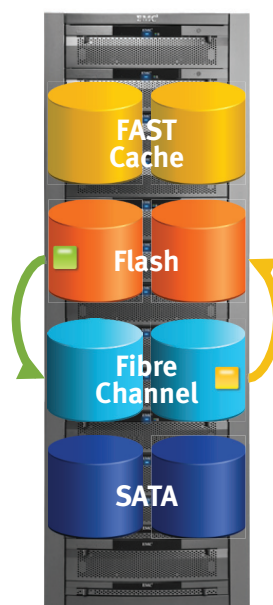
As more companies move towards hyper-consolidated virtualized data centers and the private cloud, it's even more critical to consider functionality that can not only adjust performance, but also automate processes that were once manual.

EMC UNIFIED STORAGE: SIMPLE AND EFFICIENT STORAGE

EMC® Unified Storage systems are so simple and efficient that EMC will guarantee our storage is 20 percent more efficient than other competitors. And now, EMC Unified Storage systems have two ways to intelligently use Flash drives so you can optimize performance while reducing overall costs.

FAST

- Workloads change dynamically
- Hot data is promoted to highest tier
- Cold data is demoted to lowest tier



FAST Cache

- Large, non-volatile storage cache
- Real-time reaction to workload peaks
- Enables faster performance optimization

FULLY AUTOMATED STORAGE TIERING

Measure, balance, and rebalance application workloads across several disk tiers in your storage environment with EMC fully automated storage tiering (FAST). FAST can redistribute hot, warm, and cold workloads onto Flash, Fibre Channel, and SATA drives, respectively.

FAST is especially valuable for optimizing long-term data placement, especially when workloads are unpredictable and vary from week to week. When you run FAST in the background, it's almost like having a SAN expert constantly providing regular health checks at the intervals you prefer—and automatically rebalancing workloads when it makes most sense.

EMC PROVEN SOLUTION: FAST WITH MICROSOFT SQL SERVER DATABASES

You can optimize your SQL databases with a well-planned storage tiering implementation. For example, TEMPDB and log files match up well to high-performance, lower-capacity drives—Flash or Fibre Channel (FC)—while larger content databases and inactive volumes are better matched to larger capacity, lower-cost drives like SATA.

The challenge is that yesterday's well-planned tiered layout of SQL databases can become tomorrow's problem when another workload is added to the system. Optimizing your SQL database performance requires an expert to continually analyze your environment, design a new layout, implement the solution, and manage it over time. And this solution is often repeated until the performance issues are resolved.

With FAST, storage pools are defined and implemented and the rest of the process is automated.

Without FAST

Performance optimization is a manual, ongoing process

| | |
|-----------|---------|
| Analyze | 4 hours |
| Design | 4 hours |
| Implement | 4 hours |
| Manage | 4 hours |

With FAST

Automated performance optimization

| | |
|-----------|------------------|
| Analyze | Automated |
| Design | 1 hours |
| Implement | 2 hours |
| Manage | Automated |

Example: In a recent EMC Proven™ solutions test, we demonstrated how FAST automatically rebalanced SQL I/O workloads from Fibre Channel drives to Flash drives without manual intervention. The process took a total of three hours to set up versus about two days for a typical database troubleshooting event.

EMC FAST CACHE

While FAST provides you with ongoing performance optimization and data movement recommendations, adding EMC FAST Cache is like getting a system-wide boost in performance and efficiency. FAST Cache provides an immediate performance benefit to random workloads by holding a large percentage of the most frequently used data in high-performance FLASH drives, thus reducing the required I/O from rotating drives.

It's also one of the easiest ways to increase system-wide performance. Simply insert Flash drives into standard disk array enclosure (DAE) drive slots and mark the devices as FAST Cache with EMC Unisphere™ next-generation unified storage management software. Once enabled, FAST Cache monitors incoming I/O for access frequency. If the addressed data meets the criteria for promotion, it's copied from the back-end drives into FAST Cache. The promoted data continues to serve host reads and writes from FAST Cache. As writes come in, data is asynchronously copied to the back-end drives. Should the promoted data need to be discarded to make room for new data, a least recently used (LRU) algorithm identifies what data is available to be discarded.

A common use case is to apply FAST and FAST Cache in front of FC and SATA drives. This enables warm and cold data to be moved between FC and SATA tiers while the hottest data will reside in FAST Cache.

EMC PROVEN SOLUTION: FAST CACHE WITH EXCHANGE DATABASES

In a recent EMC Proven solutions test, we demonstrated how the addition of FAST Cache enabled the system to handle nearly double the number of users. With FAST Cache enabled, each SATA drive can achieve up to almost twice as many IOPS compared to drives without FAST Cache enabled. The chart below illustrates additional performance gains.

| | FAST Cache Disabled | FAST Cache Enabled |
|-------------------------------------|---------------------|--------------------|
| Achieved database IOPS | baseline | 29% more |
| I/O database reads/sec. | baseline | 30% more |
| I/O database writes/sec. | baseline | 29% more |
| I/O log writes/sec. | baseline | 22% more |
| Average database read latency (ms) | 17 ms | 14 ms (3 ms less) |
| Average database write latency (ms) | 5 ms | 5 ms (same) |

TAKE THE NEXT STEP

To learn more about the benefits of automating performance optimization of your Microsoft applications with EMC FAST and Fast Cache, contact your local EMC representative or visit us at www.EMC.com.

AUTOMATICALLY OPTIMIZE MICROSOFT APPLICATION PERFORMANCE

EMC continually invests in technology to simplify performance optimization processes. Lengthy, manual performance troubleshooting emergencies and taking days and weeks to resolve complex performance issues can become a thing of the past with EMC FAST and FAST Cache technologies.

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