Accelerate business insights with IBM flash storage

Deploy IBM High-Performance Flash Enclosure with IBM DS8880 to get more from data and applications

Highlights

- Increase flash performance significantly with industry-leading availability

- Accelerate storage performance up to 2 times for cloud, analytics, mobile and social applications using hybrid-flash IBM® DS8880 systems

- Combine flash with traditional solid-state disk (SSD) and spinning drives using IBM Easy Tier® to get benefits in both performance and price

- Achieve consistent response times for all type of workloads

- Speed data replication with lower response time in IBM FlashCopy® operations[1]

The world of IT is vastly different than it was only a few years ago. Organizations are faced with massive amounts of data, while cloud, analytics, mobility and social workloads are rapidly raising the bar on the demands, flexibility and relevance that users put on enterprise data.

To handle this change and growth—and reap the business benefits that today's computing promises—organizations need rapid time to value in deploying technology. As users demand real-time access to data, systems must be able to respond immediately. And to assure that users, organizations and computing processes get more done more efficiently, technology has to be fast and reliable.

To meet these goals, more organizations are turning to IBM and its flash storage systems than to any other company.[2] Industry-leading IBM flash solutions reach across the IBM storage portfolio, and now include IBM High-Performance Flash Enclosure, designed for DS8880 storage systems. This new enclosure can help your business successfully support the applications driving today's workloads by delivering the fast data access and simplified management capabilities you need for the most demanding workloads and complex big-data and analytics operations.

As an easy-to-deploy, nondisruptive addition to DS8880, this flash enclosure puts optimized flash storage capacity within easy reach of both new and legacy deployments of DS8880 storage infrastructures. The result? You can make more efficient and effective use of applications and massive data to help build an advantage over the competition.

When you combine the DS8880 system and High-Performance Flash Enclosure with the industry-leading IBM z Systems™ server platform for mission-critical applications, you can be positioned to experience the efficiency and performance benefits of cloud, analytics, mobility and social environments—and the business synergy made possible by all of these platforms working together.

High-performance flash storage: fast, efficient, nondisruptive

With High-Performance Flash Enclosure, expanding storage capacity and capabilities is as simple as sliding the device into a bay in a DS8880 system. But despite simplicity, the system delivers what really matters in enterprise storage:

- **Availability matters**
  - Combined with z Systems or IBM Power Systems™, DS8880 and High-Performance Flash Enclosure deliver a highly-resilient architecture with world-class business continuity to make 24x7 access to critical applications a reality.
- **Speed matters**
  - 2 times accelerated bandwidth performance overall.[1]
  - 1.8M IOPS for transactional workloads used in real-time analytics.[1]
- **Economics matter**
  - The high performance flash enclosure requires 50 percent less space and 12 percent less energy than existing flash options.[1]
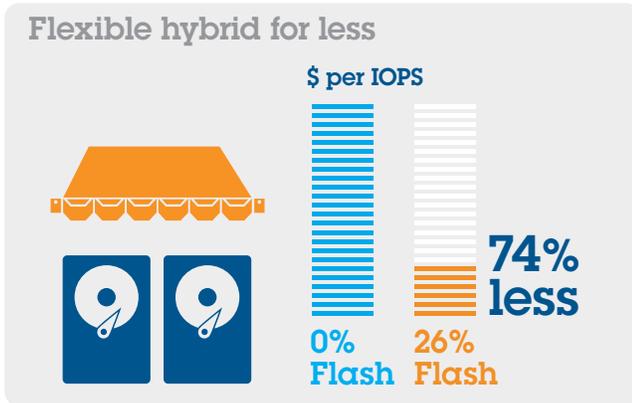
High-Performance Flash Enclosure can, in fact, create a "tipping point" for organizations that have considered flash but have been wary of cost. Combining flash technology with SSDs and traditional HDDs, and managing them with Easy Tier (license included), can provide a particularly economical solution—because storage performance and capacity can be better matched to storage and business needs. But when fast performance and massive capacity are most important, all-flash storage configurations can be used alone.
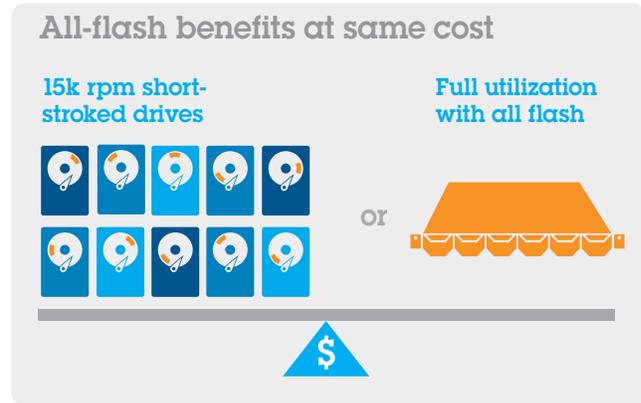
IBM DS8880: Enterprise-class performance for heavy data workloads

Designed to deliver greater than "six nines" (99.9999 percent) availability, DS8880 is an enterprise-class storage system ideally suited to addressing heavy workload requirements with scalability, rock-solid resiliency and intelligent flash performance that delivers consistent, microsecond application response times.

All-flash options help improve storage economics

Flexible hybrid for less

$ per IOPS

74% less

0% Flash   26% Flash

All-flash benefits at same cost

15k rpm short-stroked drives

Full utilization with all flash

or

$

Sources: Client and IBM internal measurements

Deployed with z Systems mainframes or open platforms, DS8880 provides robust, high-performance storage for the most demanding storage infrastructures. Deployed with High-Performance Flash Enclosure, DS8880 can deliver:

- Excellent, consistent response times despite workload types and spikes
- Footprint and energy use reduction compared to traditional drives and other flash options
- Improved data center economics utilizing Easy Tier functionality
- High availability for avoiding outages in critical application workload
- Improved disaster-recovery capabilities

High-Performance Flash Enclosure provides massive storage capacity in a compact footprint—16 or 30 encryption-capable, 400 GB flash cards in a 1U rack space[3]—in a solution targeted at I/O-intensive workload applications.

IBM High-Performance Flash Enclosure: Speed and flexibility for business results
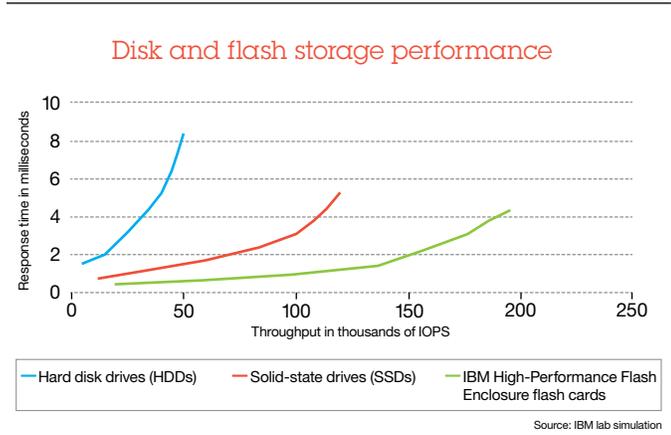
Flash cards and flash drives both offer benefits over spinning drives, including better input/output operations per second (IOPS), lower power consumption, less heat generation and lower acoustical noise. However, the flash cards offer even higher throughput using the flash RAID adapters in the high-performance flash enclosure and direct PCIe connections to the processor complexes.

With High-Performance Flash Enclosure deployed in the DS8880 storage system, Easy Tier distributes the workload among traditional flash drives and flash cards for the most efficient and effective data response according to the drives' IOPS capacity.

Just look at the business results organizations can achieve using these technologies:

- A financial services organization can provide exceptional service by speeding analytics workloads to anticipate customer demands. It can improve real-time fraud detection and credit processing, provide faster disaster recovery to reduce customer and business risk, and leverage automation to maintain 24x7 operations.
- A healthcare organization can personalize patient care by enabling evidence-based medicine, ensure that critical healthcare data is available 24x7, and reduce costs by streamlining electronic patient records.
- A retail organization can improve operational efficiencies with reliability, availability and serviceability. It can provide a more personalized customer experience. And it can more quickly address security threats.

The improvements attained by the incorporation of High-Performance Flash Enclosure can result in less time to access data and process analytics for organizations running critical workloads. DS8880 with High-Performance Flash Enclosure delivers the performance needed to meet a wide set of requirements for cloud, analytics, big data, mobile and social environments.

Disk and flash storage performance

Source: IBM lab simulation

Infrastructure matters for business analytics

Aetna, a health management company in the United States, has maintained a data warehouse covering more than 150 years of company data and transactions for millions of policy holders. Everything from patient data to claims information, from physician orders to provider reports are stored so that the company can drill down into data to perform analytics on topics ranging from drug interactions to program benefits to fraud. But with the company's 22.7 million clients, expanded and improved data management capabilities, and new generations of storage and processing technologies, Aetna holdings and infrastructure had grown to massive proportions. To enhance the performance of its storage infrastructure as well as reduce the physical space and resulting cost of its environment, Aetna recently turned to High-Performance Flash Enclosure, which it deployed in its IBM DS8870 systems.

Improvements using High-Performance Flash Enclosure have been significant:

- Flat response time regardless of the workloads running
- 50 percent reduction in time for the longest running, database jobs
- 30 percent reduction in time for host processing

The solution took only one week to install, duplicate the production environment, and validate the improvements and production readiness—with virtually no risk to production due to ease of replicating data. But it was the high, rapid response provided by High-Performance Flash Enclosure that made the true difference. The system now accommodates an average of 57,000 queries a day—with a peak that has reached as high as 131,000. The change represents a significant improvement over the previous deployment's slower performance, which at one point forced Aetna to cap its workloads at 75 simultaneous queries. Now, with faster storage performance, Aetna is able to achieve its goals for improved medical analytics, customer service, cost savings and business performance.
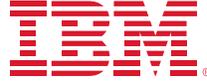
Why IBM?

IBM brings together the latest in high-performance flash storage with the proven reliability and extreme high availability of IBM enterprise-class storage solutions. Organizations can access business-transforming insights instantly, keep e-commerce sites up and running, and do it all confidently with a proven, highly resilient system. For organizations seeking an ideal combination of performance, high availability and agility, DS8880 storage systems and High-Performance Flash Enclosures are the logical choice.

For more information

To learn more about the IBM DS8000® storage family, including IBM DS8880 and IBM High-Performance Flash Enclosure, please contact your IBM representative or IBM Business Partner, or visit: **ibm.com**/ds8000/

To learn more about the Aetna experience with IBM flash, visit: https://www.youtube.com/watch?v=pegNdgG4b-A&index=8&list=PLUbRx39vvOvhCLThck3BlZSd7cl9DPKZ7

Additionally, IBM Global Financing can help you acquire the IT solutions that your business needs in the most cost-effective and strategic way possible. For credit-qualified clients we can customize an IT financing solution to suit your business requirements, enable effective cash management, and improve your total cost of ownership. IBM Global Financing is your smartest choice to fund critical IT investments and propel your business forward. For more information, visit: **ibm.com**/financing

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[1] IBM lab measurements.

[2] "Report: IBM Leads Flash Storage System Market as Customers Look for Faster Access to Big Data Insights," *IBM Corp*., June, 16, 2014. http://www-03.ibm.com/press/us/en/pressrelease/44169.wss#release

[3] Maximum of 1,536 disk drives and 240 flash cards in a four-frame configuration

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