IBM FlashSystem storage speeds IBM Tivoli Storage Manager backups

Achieve faster backups, while reducing costs and saving data center space

Highlights

- IBM® FlashSystem® storage arrays accommodate any capacity requirement and outperform conventional disk systems
- IBM FlashSystem storage is easily shared by multiple IBM Tivoli® Storage Manager databases, using the virtualization capabilities of IBM FlashSystem V9000 or IBM SAN Volume Controller
- Tivoli Storage Manager delivers a single point of control and administration for backup and recovery and enables reliable, cost-effective backups and fast recovery for conventional, virtual and cloud environments

Enterprises worldwide are becoming data-backup constrained, with ever-more data to protect, yet less time to perform backups. To speed backups, IT managers have traditionally configured available resources from their storage arrays as massive backup caches. In the past this was an effective strategy, but it is no longer enough: ever-faster response times and greater levels of data protection are required by businesses in today's real-time, customer-driven environment. The search for faster, more efficient data backups has led enterprises to seek performance gains from flash storage solutions.

The challenge: meet growing data protection needs

In recent years, the slow response times and very poor throughput performance of disk-based systems have driven the search for lower-latency, higher-bandwidth solutions. Some enterprises are seeing exploding data volumes overwhelm their data protection capabilities, despite using Tivoli Storage Manager, a widely deployed data protection solution that protects up to ten times more user data per day per backup server than competitors' solutions. Progressive testing conducted by IBM demonstrates that efficiency is the key to meeting data protection requirements in the data centers of today and tomorrow.

The solution: increase backup efficiency and speed, while lowering costs

In tests run by IBM, the Tivoli Storage Manager database was moved from disk to IBM FlashSystem without any system downtime or application performance degradation. Performance comparisons were run using a high-performance disk-based storage array with an impressively large 384 drives equaling 115 TB of mostly unneeded storage capacity. The high disk-drive count was needed to provide I/O throughput, not database capacity. This configuration still couldn't match the performance, cost and efficiency profile of a single two-rack-unit IBM FlashSystem storage array with only 12 TB of storage capacity. In fact, compared to the disk array, IBM FlashSystem sped performance by 18 percent and reduced footprint, price and power consumption by 88, 90 and 99 percent, respectively.

As the performance improved, the gating piece of hardware shifted from the disk-based storage array to SAN Volume Controller. IBM FlashSystem storage had plenty of headroom to spare, and performance gains should be even greater when using the IBM FlashSystem V9000 storage array.

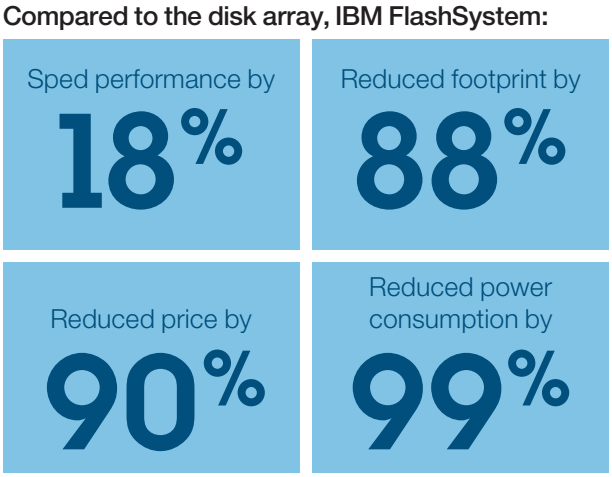

Figure 1. In tests, IBM FlashSystem storage outperformed high-end disk

The cost metrics in this comparison are especially important to note. Enterprises using Tivoli Storage Manager to provide backup services are especially cost conscious. IBM FlashSystem configurations of 2 TB are priced competitively with in-server flash options, such as Peripheral Component Interconnect Express (PCIe) cards and various flash adapters. Beyond 2 TB, IBM FlashSystem is more economical than trying to deploy in-server flash in two or more Tivoli Storage Manager servers, because IBM FlashSystem arrays can be shared, whereas PCIe cards cannot.

Client examples

Recently, one of the top academic health science centers in the US was troubled by expanding backup windows, due to a lengthy process of search and removal of expired data on existing spinning disks. IBM FlashSystem arrays were virtualized by SAN Volume Controller to support the Tivoli Storage Manager backup and archive environment, in addition to other applications. The solution resulted in a 90 percent reduction in the time dedicated each day to the process of finding and deleting expired data post-backup. Additionally, because of the ability to virtualize and share storage among various applications, resources continued to be available for other applications needing performance boosts. This was especially important in instances where new applications were being added to the network, such as Epic, that required high-performing storage. The ability to share storage and enhance the entire infrastructure, without the need for additional hardware, has enabled efficiencies not previously available.

Another client, a world-recognized children's hospital with multi-petabyte data growth, needed to implement IT solutions which would continue to effectively support their mission and meet service levels. Embracing the concept of software-defined storage, the children's hospital moved file-based applications off spinning disks to an IBM FlashSystem storage array.

This resulted in five times faster backup version queries, a seven-fold increase in Tivoli Storage Manager request responsiveness and 17 times higher performance to databases. The solution's positive effect on total cost of ownership was readily apparent.

Tivoli Storage Manager

Tivoli Storage Manager products provide backup, snapshot, archive, recovery, space management, bare machine recovery and disaster recovery capabilities. These capabilities can help protect data on systems of all sizes, including virtual machines, file servers, email, databases, enterprise resource planning (ERP) systems, mainframes and desktops—all from a single environment that expands as data grows. Along with simplifying backups by consolidating administration tasks, Tivoli Storage Manager can significantly reduce data backup and recovery infrastructure costs[1] and enable cloud backups with OpenStack and VMware vCloud integration.

A Tivoli Storage Manager solution typically involves lower-cost storage for the backup repository and higher-performing storage for the Tivoli Storage Manager database, which is used to track backup metadata. To increase efficiency, multiple Tivoli Storage Manager servers are often configured to handle hundreds of terabytes to petabytes of backup storage. Each Tivoli Storage Manager database server can consume up to 4 TB of storage for its repository.

IBM FlashSystem

The IBM FlashSystem family is a suite of enterprise-class all-flash storage platforms powered by IBM FlashCore™ technology that offers scalable performance, agile integration and enduring economics. IBM FlashSystem is ideal for delivering the dynamic performance needed to power mission-critical applications, high-velocity databases and ever-expanding data backups. IBM FlashSystem V9000 is an all-flash storage array that combines the high performance, ultra-low latency, efficiency and enterprise reliability of FlashCore technology with a rich set of the storage features found in advanced software-defined storage solutions. This includes real-time compression, virtualization, dynamic tiering, thin provisioning, snapshots, cloning, replication, data copy services, and high-availability configurations.

Figure 2. The IBM FlashSystem V9000 storage array

The dynamic performance capabilities of IBM FlashSystem V9000 storage allow tailoring of solution architectures to specific workloads based on client needs. Additionally, the superior data economics of IBM FlashSystem enable enterprises to implement and manage comprehensive virtualization strategies, while realizing both immediate and long-term economic benefits. Superior capabilities and economics made IBM FlashSystem the ideal platform to improve Tivoli Storage Manager data-backup performance.

Conclusion

IBM test results demonstrate that when IBM FlashSystem storage is used to accelerate Tivoli Storage Manager server's database I/O, the challenges and costs of protecting growing volumes of data suddenly become much more manageable. Because of its cost advantages over high-performance disk-based enterprise storage, increasingly, enterprises that implement Tivoli Storage Manager are also deploying IBM FlashSystem for their entire active data sets.

Why IBM?

Innovative technology, open standards, excellent performance, a broad portfolio of storage-proven software, hardware and solutions offerings—all backed by IBM's recognized e-business on demand leadership—are reasons you should consider IBM storage solutions, including IBM FlashSystem. In choosing IBM, you get some of the best storage products, technologies, services and solutions in the industry, without the complexity of dealing with myriad hardware and software vendors and system integrators.

For more information

To learn more about IBM Tivoli Storage Manager and IBM FlashSystem storage products and solutions, please contact your IBM representative or IBM Business Partner, or visit the following websites:

- **ibm.com**/systems/storage/flash
- **ibm.com**/software/products/en/tivostormana

Additionally, IBM Global Financing can help you acquire the IT solutions that your business needs in the most cost-effective and strategic way possible. We'll partner with credit-qualified clients to customize an IT financing solution to suit your business goals, 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

IBM Systems
Route 100
Somers, NY 10589

Produced in the United States of America
January 2015

Actual available storage capacity may be reported for both uncompressed and compressed data and will vary and may be less than stated.

[1] "The business value of improved backup and recovery," IBM thought leadership white paper, January 2013 (http://public.dhe.ibm.com/common/ssi/ecm/en/tiw14150usen/TIW14150USEN.PDF)

TSS03163-USEN-00