

Take control of big data with new tools for your IBM z/OS environment



Decrease costs and streamline operations with enhanced IBM Tivoli storage management portfolio

Highlights

- Improve storage performance and availability, streamline data migration, and help ensure backup and recovery—while lowering costs and reducing the IT workload
 - Simplify management of multi-vendor storage devices, provide visibility into the storage environment and help manage out-of-control storage growth
 - Break down IT management silos in your IBM® z/OS®-based data storage environment
 - Provide a single point of control that gives all administrators the same view into the environment
 - Gain better visibility into data and leverage improved analytics capabilities
-

Big data is everywhere. Some of it is created by human interactions: Wal-Mart handles more than a million customer transactions every hour.¹ Some is generated by technology: Radio frequency identification (RFID) systems can produce up to 1,000 times more data than bar codes.¹ And an increasing amount is created on the go: More than five billion people today use mobile phones for calling, tweeting, texting and browsing.¹

As a result, recent estimates say worldwide business data is now doubling every six months¹ to 1.2 years.²

In your enterprise environment, the repository for big data is likely your IBM z/OS-based systems. Built for processing and storing massive amounts of data, IBM System z® mainframes and their storage subsystems have provided capacity, availability and reliability for business-critical information for years.

But big data can mean big changes. And explosive data growth means you need not only industry-leading technology as your data repository, but also industry-leading tools for managing the data that's flooding in today—and the data that's coming your way in the future.

IBM Tivoli® storage management for z/OS solutions provide you with the tools you need to manage this rapidly growing volume of data. Integrating smoothly into your existing z/OS-based environment, these solutions deliver the capabilities you need to improve performance and availability, streamline data migration, and help ensure backup and recovery—all while lowering costs and reducing the IT staff workload.



The growth of big data brings challenges and opportunities

Today's data growth stretches far beyond the structured information in databases or data from the IT environment that mainframe systems traditionally handled. Today, semi-structured and unstructured data—in the form of emails and tweets, video and audio, text, presentations, and other formats—are creating exponential growth in what is known as *big data*, and raising storage and data management challenges.

What's more, as the mainframe environment has become more complex, traditional management practices have not been able to keep pace. Approaches have too often been limited to merely storing big data. Organizations have found themselves without the storage management tools that make it possible to apply analytics to their unstructured data, extract business insights, use data as the basis for actions to improve operations, create new efficiencies or build a competitive advantage.

To meet these business and operational goals, organizations need solutions that can simplify the management of multi-vendor storage devices, provide visibility into the storage environment and help manage out-of-control storage growth. An effective storage management solution can minimize performance bottlenecks, ease capacity upgrades and system changes, support the creation and execution of storage allocation policies, and minimize outages—all while combining information from across the enterprise.

Enterprise storage solutions must be integrated and cost-effective

Coping with—and ultimately taking advantage of—the changing face of structured and big data in enterprise environments requires enhanced solutions for data management. These must provide integrated capabilities for addressing the variety of information formats that reside under the big data umbrella. They must simplify operations for installation, configuration and management. And for environments where many administrators are struggling not only with the rising volumes of data but with stagnant—or even reduced—budgets for managing it, tools must be able to both lower costs and maximize efficiency while enabling operation, when necessary, by less-skilled staff.

Deployed either as the complete, eight-product portfolio, as the four-product IBM Tivoli Advanced Storage Management Suite for z/OS, or individually, Tivoli storage management for z/OS solutions give you the comprehensive and integrated capabilities you need to break down silos of data management in your z/OS-based data storage environment.

Working together with specialized solutions you may already have deployed, such as the IBM data facility system managed storage hierarchical storage manager (DFSMSHsm) productivity tool or the IBM Tivoli OMEGAMON® family of performance monitors, the Tivoli portfolio can increase the efficiency of your storage management. Integration enables improved usability for your full range of z/OS-focused data management solutions. And it provides a single point of control that gives all administrators the same view into the environment regardless of the system or application they are running.

The growth and importance of big data

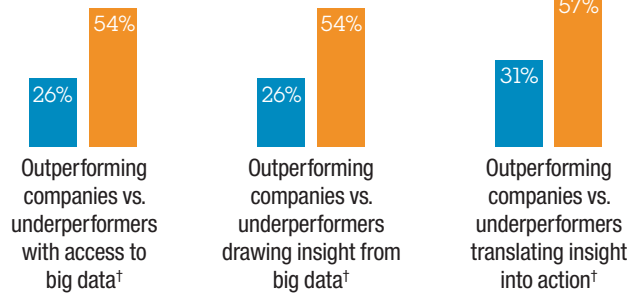
Change in the world's data



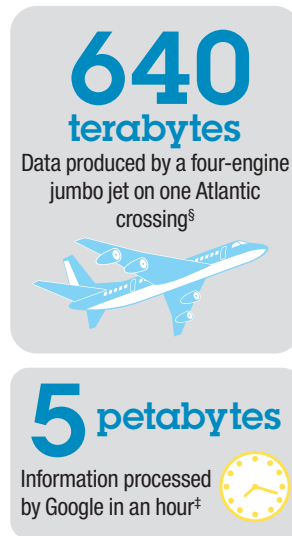
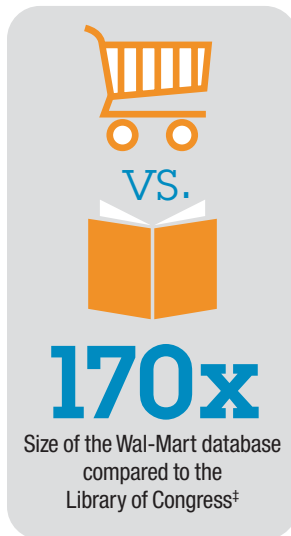
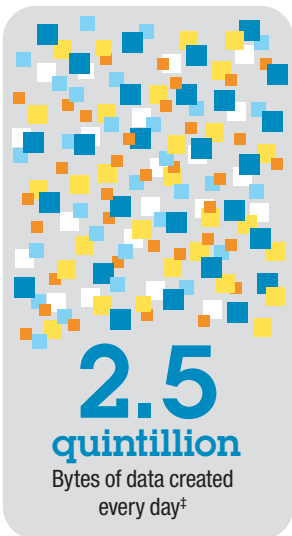
80%
World's information that is unstructured*

15x
Rate of unstructured data growth compared to structured data*

The importance of using big data



The volume of big data



The pervasive use of big data



* Paul C. Zikopoulos, et al., "Understanding Big Data," McGraw Hill, 2012.

† IBM Institute for Business Value, "IBM Global CEO Study," IBM Corp., 2012. <http://ibm.co/Hg7ltM>

‡ Barry Devlin, et al., "Big Data Comes of Age," Enterprise Management Associates, November 2012.

§ Harish Kordata, "Big Data: The Coming Sensor Data Driven Productivity Revolution," Wikibon, August 10, 2012. http://wikibon.org/wiki/v/Big_Data:_The_Coming_Sensor_Data_Driven_Productivity_Revolution

The IBM portfolio is designed for both mainframes and their managers

Integrated Tivoli storage management for z/OS solutions, in fact, provide capabilities that benefit not only storage systems but also systems administrators.

Benefits for systems

- Automated processes and autonomic operations help ensure storage health, integrity, compliance and recoverability
- Solutions deliver industry-leading capabilities, currency and overall service, including:
 - Performance and availability monitoring with root-cause identification
 - Tailored alerts, task automation and preplanned corrective actions that manage by exception
 - Reduced time to audit and to correct DFSMSHsm errors
 - Reduced workload for the CPU
 - Maintenance without taking key subsystems offline or impacting application uptime

Benefits for administrators

- Enhanced management capacities reduce the reliance on highly skilled specialists, enabling lower-level technicians to leverage capabilities via a centralized portal to speed problem determination and reduce barriers between System z and distributed storage administration
- A comprehensive view of the storage infrastructure enables integrated management of the z/OS storage environment with a common set of tools designed to:
 - Easily monitor and manage the performance and availability of storage subsystems
 - Simplify daily storage management with easy-to-use administration tools
 - Optimize productivity with reporting, analytics, policy implementation and automation

For a manufacturer, backups are streamlined and safe

To optimize storage resource utilization and simplify administration tasks, a leading manufacturer in the UK replaced difficult-to-manage heterogeneous storage systems with IBM XIV® Gen3 Storage System, IBM System Storage® TS3100 Tape Library Express and an IBM System z server running IBM Tivoli Advanced Backup and Recovery for z/OS.

The new solution gave the company the ability to better convey data backups from the storage system to the tape library for archival and recovery. It not only improved storage utilization, it also reduced operating costs. It helped improve data availability and system reliability. And its centralized management simplified storage administration for a small IT staff.

Administrators get powerful new tools with portfolio enhancements

Enhancements to Tivoli storage management for z/OS solutions add capabilities to help support storage environments in becoming more efficient and effective than ever before. New capabilities reduce resource usage, support new storage hardware and enable improved recovery processing—with reduced recovery time. They provide enhanced support for catalog management. Their predictive search abilities improve responsiveness and accuracy. In addition, these solutions are now easier to install and configure.

Enhanced portfolio solutions give z/OS administrators improved monitoring and management across the entire big-data spectrum, with better visibility of existing and new data, improved data analytics capabilities, and greater access to the insights data can provide for improving operations or building the business.

Save money with optimization and efficiency

Tivoli storage management for z/OS solutions are designed to help organizations save money in several ways:

- With IBM as a single source for solutions, it reduces vendor cost and complexity.
 - These solutions help optimize storage hardware, enabling deferment or delay of new purchases.
 - These solutions help reduce storage-related outages and attendant costs.
 - Support for improved governance helps reduce the risk of data loss.
 - Efficiencies reduce personnel workload and cost with:
 - Dashboarding, management by exception, smart alerts and problem prevention
 - Automated response to daily issues, eliminating or augmenting staff actions
 - Elimination of the need for “war rooms” dedicated to problem solving
 - Common tools and capturing of expert knowledge, which reduce the IT learning curve
 - A portfolio approach to delivering solutions that reduces buying complexity
-

Extend your storage capabilities with the IBM management portfolio

Who can benefit from Tivoli storage management for z/OS?

Organizations that have deployed DFSMSHsm can gain greater efficiency and effectiveness from these solutions using single or multiple components, or the full portfolio.

Organizations that have deployed at least one Tivoli storage management for z/OS solution can benefit from integrated capabilities across all solutions by migrating to the full portfolio.

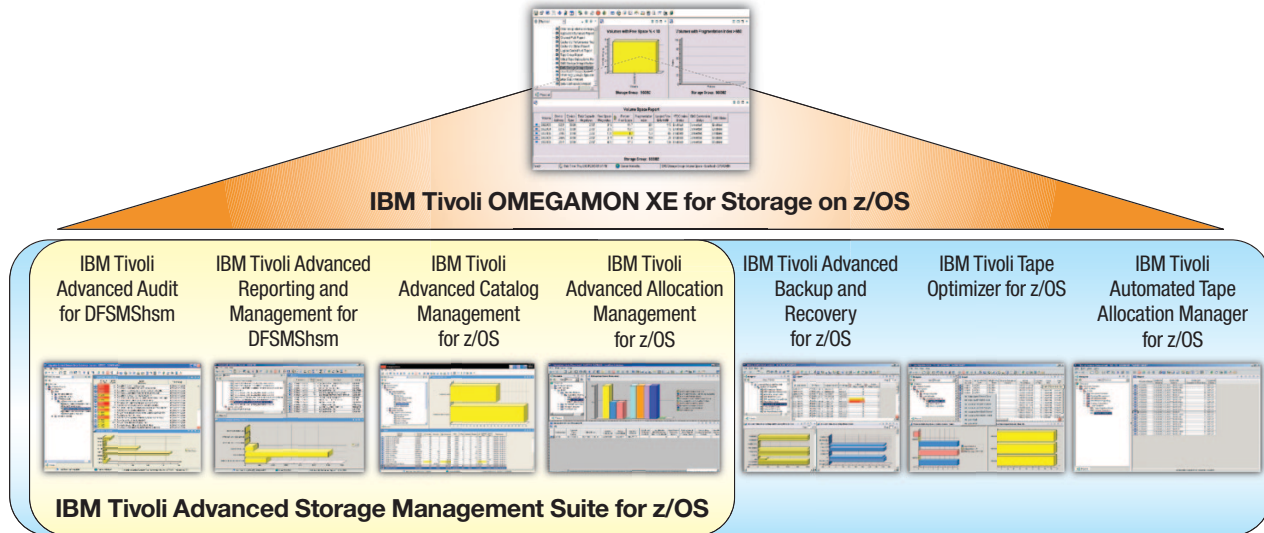
Organizations that have deployed one storage management product—besides IBM Tivoli OMEGAMON XE for Storage on z/OS—can gain new capabilities for monitoring and managing their hardware and software environments when they deploy other Tivoli OMEGAMON solutions.

Organizations that have deployed any product from the Tivoli OMEGAMON family—for example, IBM Tivoli OMEGAMON for z/OS or IBM Tivoli OMEGAMON for CICS®—can achieve significant improvements in monitoring and management by adding Tivoli OMEGAMON XE for Storage on z/OS.

Broad or specialized, IBM solutions meet storage management needs

The Tivoli storage management for z/OS portfolio provides industry-leading breadth and depth of capabilities with powerful, integrated monitoring and management for storage on z/OS platforms.

IBM Tivoli storage management for z/OS portfolio



Cornerstone capabilities

The cornerstone of the portfolio is Tivoli OMEGAMON XE for Storage on z/OS, which provides broad storage management capabilities that support and enhance the more specialized solutions in the portfolio.

IBM Tivoli OMEGAMON XE for Storage on z/OS delivers capabilities for performance and availability management to support optimal use of z/OS-based, mainframe-attached storage input/output subsystems for both direct access storage devices and tape. These include channels, control units, direct-access storage devices, tape devices and data sets. The Tivoli OMEGAMON XE solution is designed to increase visibility into the enterprise environment from a single screen, reduce the time required for IT personnel to perform management tasks, increase automation of storage operations, enhance problem management, expand analytic capabilities and reduce storage management costs.

An integrated suite

Four other solutions comprise Tivoli Advanced Storage Management Suite for z/OS, which delivers feature-rich storage management, audit and reporting capabilities in software targeted to more specialized uses.

IBM Tivoli Advanced Audit for DFSMSHsm offers an easy and safe way to help verify the health of hierarchical storage environments with fast and accurate audits and diagnostics without straining DFSMSHsm system resources. Designed to help prevent temporary or permanent loss of data access with nondisruptive performance and availability monitoring, the solution leverages powerful capabilities to gather critical information for a more complete view into the DFSMSHsm environment, as well as automated corrective actions to help resolve errors.

IBM Tivoli Advanced Reporting and Management for DFSMSHsm gathers critical information from the DFSMSHsm storage management environment and delivers an interactive display with customizable reporting capabilities. The solution's easy-to-read, daily DFSMSHsm health reports on environment, maintenance cycles, ad hoc reporting and automated command generation help ensure uninterrupted data set availability to reduce CPU and storage hardware cost. Integrating easily with Tivoli Advanced Audit for DFSMSHsm, the solution is designed to help improve IT productivity with speed and flexibility of process and actions.

IBM Tivoli Advanced Catalog Management for z/OS is designed to protect a catalog's complex structural integrity, provide alerts for potential errors and reduce recovery time in the event of an error. Proactively analyzing, isolating and resolving issues before they become major problems, the solution manages catalogs across the enterprise with an easy-to-use interface. Speeding and simplifying diagnostics, it permits catalog maintenance while applications are open and allows what-if simulation to preview effects of actions, helping ensure high service levels with optimized system availability.

IBM Tivoli Advanced Allocation Management for z/OS provides comprehensive centralized storage allocation management to help prevent outages to mission-critical z/OS applications by controlling space issues. User-friendly, rules-based definitions and centralized control of volume use in direct-access storage devices help in preventing and recovering from space-related x37 abends (when a data set becomes full). By minimizing out-of-space conditions, this solution helps control task failures and supports continued productivity for users. Comprehensive activity reporting enables administrators to view total abends and errors avoided or recovered.

Extended capabilities

Additional solutions may be deployed individually or as part of the Tivoli storage management for z/OS portfolio.

IBM Tivoli Advanced Backup and Recovery for z/OS supports fast recovery from outages by automatically identifying critical application data on z/OS-based systems that has not

been backed up, managing backups, supporting recovery from remote backup sites and providing audit trails. By eliminating duplication of backups, the solution can help reduce the CPU cost of daily backup/recovery activity. It provides reporting to document which data sets were backed up and to document compliance with legal and regulatory requirements.

IBM Tivoli Tape Optimizer on z/OS enables flexible copying options for migrating a single data set or an entire library to and from a variety of tape devices and media—helping to speed copying processes, maximize resources, and facilitate compliance and disaster recovery. Designed to maximize the efficiency of tape-copy processes and optimize tape utilization, the solution helps reduce costs by expediting copy jobs with multitasking capabilities, automatic restart features and sophisticated filters.

IBM Tivoli Automated Tape Allocation Manager for z/OS addresses tape device availability to provide automatic, unattended sharing of tape resources for optimal use across multiple images; reduce hardware costs; and improve application throughput. The solution can improve the organization's return on investment by maximizing existing tape resources, reducing operational overhead and enhancing batch-processing efficiency. It gives operators insight into tape device use and activity while reducing the need for operator intervention with automated functions.

For an IT provider, records are consistent and reliable

A public IT and communications solutions provider in Germany performs migrations or backups on millions of data sets every month in its z/OS-based storage environment. Because information in the data sets had to be consistent and reliable, the company needed to manage them in a way that would validate the consistency of control records and analyze log records.

Implementing Tivoli Advanced Audit for DFSMSHsm, the company gained the reporting and management tools it needed to optimize its z/OS environment, enabling storage administrators to maintain healthy metadata environments and help prevent temporary and permanent data loss.

Why IBM?

Solutions in the Tivoli storage management for z/OS portfolio are designed for simple integration with one another, for optimal operations with multi-vendor compute and storage devices, and for use with other IBM management tools in z/OS-based environments. Addressing the requirements of both the resource assets and the IT personnel charged with managing storage, these Tivoli solutions provide a comprehensive set of storage management capabilities that proactively work not only to avoid problems but to quickly identify, isolate and remediate problems that might occur. IBM provides a single source for storage management solutions that may be implemented as a complete portfolio or in any combination of individual solutions to meet an organization's unique IT and business needs. Importantly, these tools can help organizations efficiently manage their rapidly growing data volumes—especially critical on today's smarter planet, where instrumented, interconnected and intelligent businesses collect, process, use and store more information than ever before.

For more information

To learn more about the IBM Tivoli storage management for z/OS portfolio, please contact your IBM representative or IBM Business Partner, or visit: ibm.com/software/tivoli/products/storage-mgr-zos/productline/index.html

Additionally, IBM Global Financing can help you acquire the software capabilities that your business needs in the most cost-effective and strategic way possible. We'll partner with credit-qualified clients to customize a financing solution to suit your business and development goals, enable effective cash management, and improve your total cost of ownership. Fund your critical IT investment and propel your business forward with IBM Global Financing. For more information, visit: ibm.com/financing



© Copyright IBM Corporation 2013

IBM Corporation
Software Group
Route 100
Somers, NY 10589

Produced in the United States of America
November 2013

IBM, the IBM logo, ibm.com, Tivoli, z/OS, System Storage, System z, CICS, OMEGAMON, and XIV are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at "Copyright and trademark information" at ibm.com/legal/copytrade.shtml

This document is current as of the initial date of publication and may be changed by IBM at any time. Not all offerings are available in every country in which IBM operates.

The client examples cited are presented for illustrative purposes only. Actual performance results may vary depending on specific configurations and operating conditions.

THE INFORMATION IN THIS DOCUMENT IS PROVIDED "AS IS" WITHOUT ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING WITHOUT ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY OR CONDITION OF NON-INFRINGEMENT. IBM products are warranted according to the terms and conditions of the agreements under which they are provided.

The client is responsible for ensuring compliance with laws and regulations applicable to it. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the client is in compliance with any law or regulation.

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

¹ "Big Data Meets Big Analytics," *SAS Institute, Inc.*, 2012.
http://www.sas.com/resources/whitepaper/wp_46345.pdf

² "eBay Study: How to Build Trust and Improve the Shopping Experience," *Know IT Information Systems*, May 8, 2012.
<http://knowwpcarey.com/article.cfm?cid=25&aid=1171>



Please Recycle
