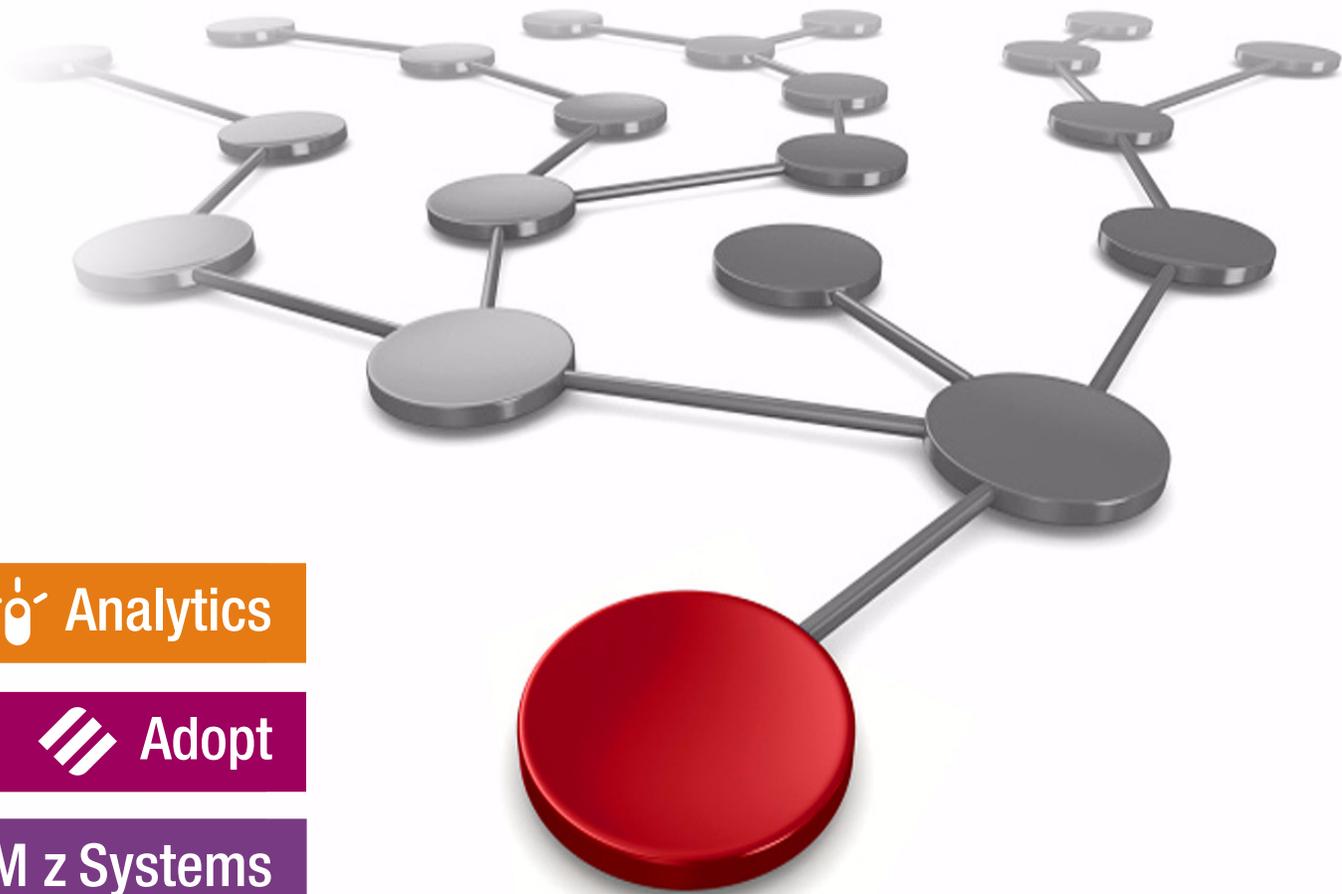


# Reliable Analytics by Using IBM z13

Lydia Parziale



 Analytics

 Adopt

IBM z Systems

# Reliable Analytics by Using IBM z13

## IBM Redbooks Solution Guide

Analytics projects mainly draw on mainframe-based transactional data. However, in the last two decades, analytics solutions have been deployed as departmental applications, based on very specific business needs of the requesting department.

This IBM® Redbooks® Solution Guide describes how IBM z13™ can help organizations maximize their current IT investments while adding functionality and improved price and performance with z13 over IBM zEnterprise® EC12 (zEC12). With new z13 features, applications can gain increased throughput for distributed operational business intelligence (BI) and IBM DB2® query workloads, thus saving money in hardware, software, and labor. The IBM z Systems™ server excels as custodian of the data model, providing an accurate, secure, single copy of information that ensures veracity of the data for reliable analytics and provides centralized control over decision information (see Figure 1).

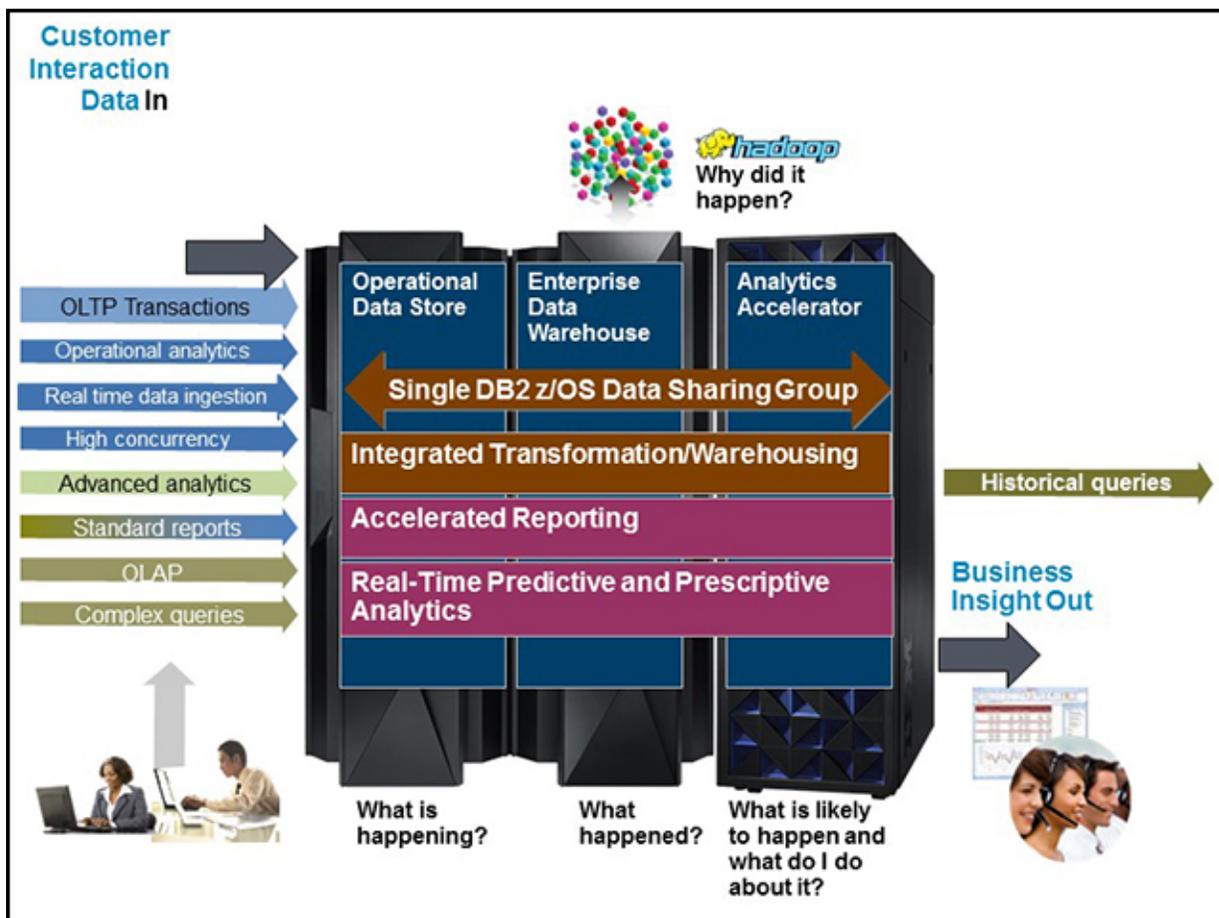


Figure 1 Centralized control of decision information

## Did you know?

Many new features and functions of IBM z13 can benefit your organization's workloads; here are several:

- Addition of SIMD-MASS and ATLAS libraries for IBM z/OS® and Linux on z Systems: single-instruction, multiple-data (SIMD), Mathematical Acceleration Subsystem (MASS), and Automatically Tuned Linear Algebra Software (ATLAS)
- Allow construction of richer, more complex analytics models from independent software vendors (ISVs) and analytics products from IBM Software Group that exploit SIMD to provide better accuracy of insight
- Allow Analytics workloads to be ported from IBM Power Systems™ and x86 with ease which can accelerate analytics to provide speedier business insight
- Increase in programmer productivity of ISV and customer analytics workload development leading to rapid business insight generation for a competitive advantage
- Simultaneous multithreading (SMT) allows processing of more workloads in the same amount of time, together with IBM z Integrated Information Processor (IBM zIIP) and Integrated Facility for Linux (IFL)
- Enterprise security (built in, one-of-a-kind cryptographic and encryption functions) maintaining data securely, inside the platform.
- Large memory support (for z/OS and DB2).

## Business value

Data is the most important resource of any organization. The way data is viewed by an organization depends on the organization's needs and falls into three categories:

- Real-Time View: The operational systems that house the books of record. These data sources are critical to day-to-day business processes (systems of record).
- Historical View: Data warehouses, marts, and others. These data sources support reporting and predictive model creation.
- Predictive View: Analytics models and software. These are the tools that deliver actionable insights from data.

Business-critical analytics solutions depend on where source data resides. IBM z Systems servers deliver a single workload-optimized system for both operations and analytics by integrating and managing these real-time, historical, and predictive views of data.

Real-time analytics-based decisions are a top priority for outperforming organizations, and this requires tight integration with operational data. When data resides on disparate and distant servers, certain problems might be encountered:

- Significant effort is spent for copying and moving data, resulting in veracity and security issues.
- Business has no access to the most current view (data in systems of record is in constant change).
- Complicated, bifurcated infrastructure requires multiple skill types.
- No single point of management exists.
- Business continuity concerns exist.

With keeping data and analyzing it at the source, several advantages can be identified:

- Less movement of data results in higher quality and less risk of loss.
- Integration with core systems delivers the most accurate view to the business.

- Integrated architecture leverages existing environment.
- Single view simplifies management.
- Business continuity is inherited from core systems.

IBM z Systems and, in particular, IBM z13 with its new features and functions enable all of the advantages of improved performance and lowered costs, providing real-time analytics-based decisions.

## Solution overview

z Systems analytics enables organizations to improve performance and lower cost by bringing the analytic processing to where the data resides (see Figure 5-6). Organizations can maximize their current IT investments while adding functionality and improved price and performance with z13 over zEC12. With new z13 features, applications can gain increased throughput for distributed operational business intelligence (operational BI), DB2 query workloads, thus saving money (hardware, software, labor). Businesses today need to make better, faster decisions based on reality rather than on assumptions; that means taking control of enormous volumes of data. The combination of DB2 Analytics Accelerator, IBM Cognos® BI, and IBM SPSS® on the z13 platform gives that control and opens a whole different way of doing things (see Figure 2).

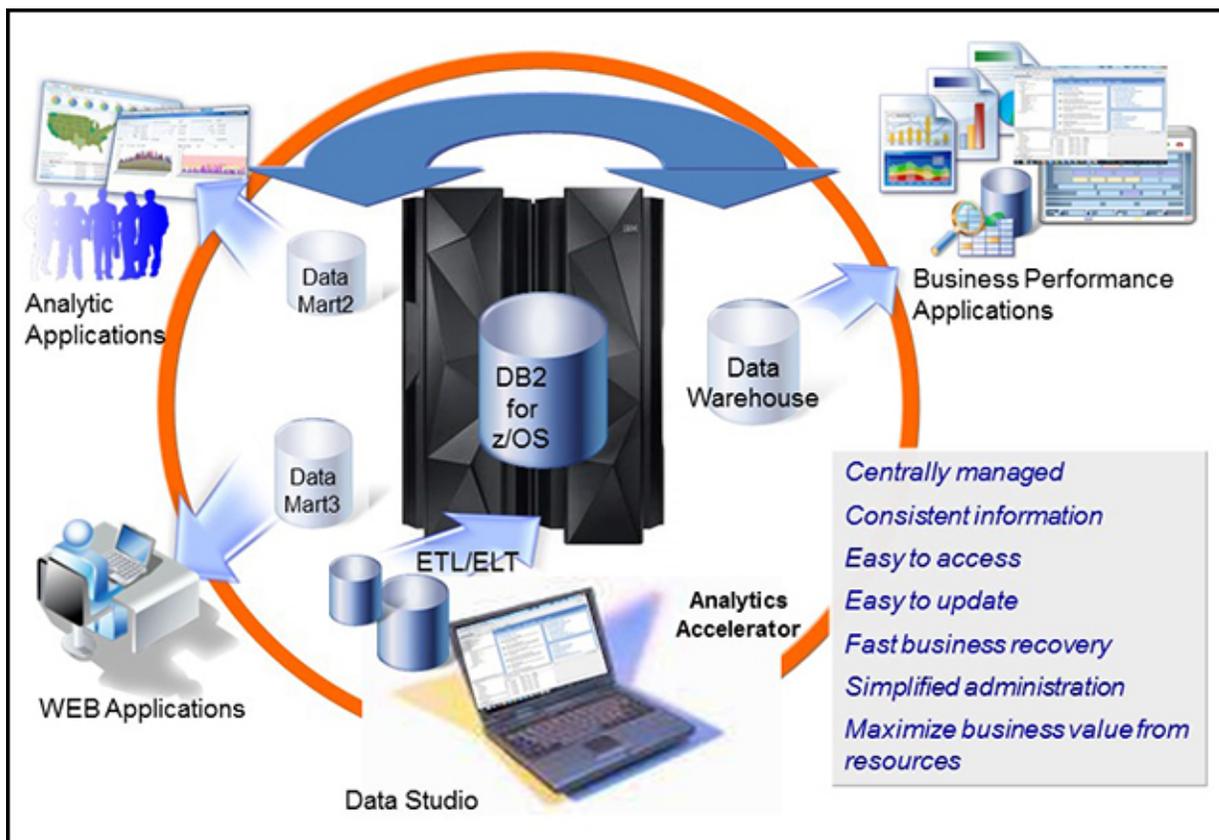


Figure 2 IBM z13 and control of large volumes of data

The main strengths of the z Systems platform (virtualization, scalability, elasticity, security, and resiliency) provide a robust infrastructure, capable of managing enormous volumes of data. In this solution, because core data stays on z13, less movement of data occurs, resulting in higher quality and less risk of loss.

## Solution architecture

Using a mobile application as an example (Figure 3), when the user signs on, the transaction flows through an IBM MobileFirst Platform Server running on Linux on z Systems to an LDAP server on z/OS to validate the user's signon credentials. After successful validation, the transaction then proceeds through the z/OS transaction environment where all of the data resides in DB2 z/OS. IBM CICS® transactions are also processed in the same z Systems environment and all of the analysis is performed without moving any data, resulting in extremely fast performance.

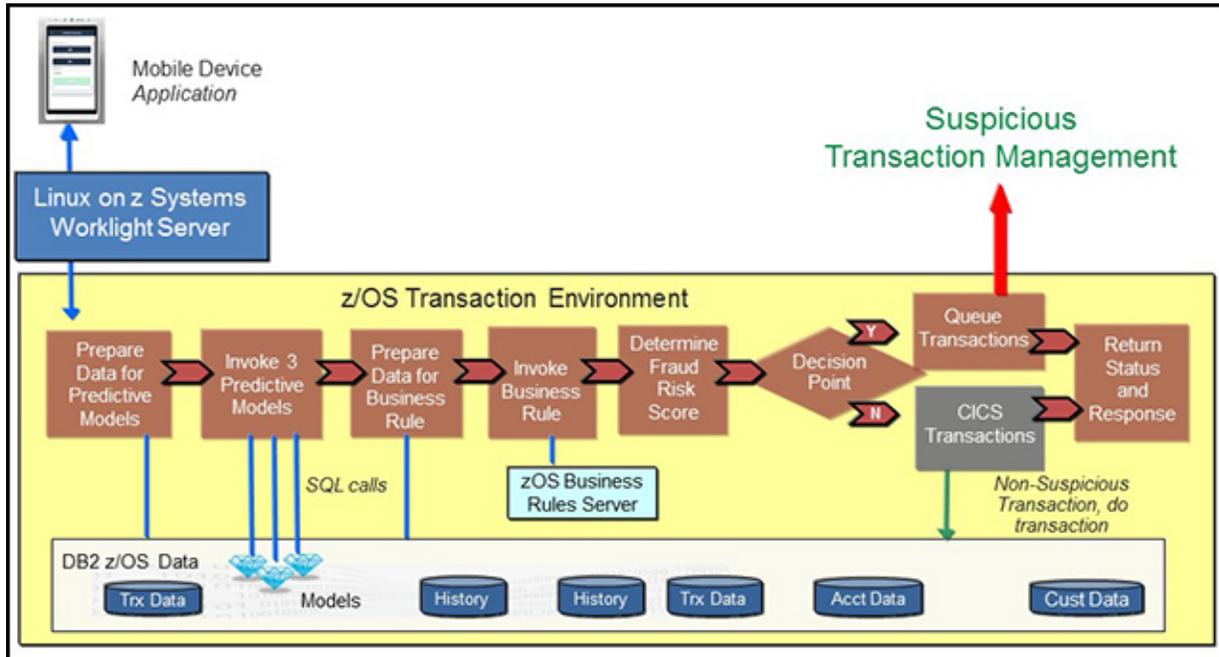


Figure 3 Example z13 solution architecture for a mobile application

## Usage scenarios

Using Figure 3 as an example, we describe a banking scenario that shows how z Systems can optimally integrate transactions and analytics through the use of real-time fraud detection.

A banking user sets up mobile access to multiple accounts, some of which are the user's own, some of which the user has access to but are owned by others. This user is travelling abroad on business and wants to initiate some funds transfers through a personal mobile device. The user has two accounts and wants to transfer money from one account to the other. The entire transaction is extremely fast; all operational analytics reside on the z Systems and can take place at banking transaction speeds.

## Integration

Also, Figure 3 shows how z Systems can optimally integrate transactions and analytics through the use of real-time fraud detection, using IBM z13, a Linux on z Systems IBM MobileFirst Platform Server, CICS, SPSS Predictive Analytics Enterprise software, DB2 for z/OS, and the IBM Business Process Manager.

In the usage scenario, when the user signs on, the transaction flows through an IBM MobileFirst Platform Server running on Linux on z Systems to an LDAP server on z/OS to validate the user's signon credentials. After successful user login, the z/OS banking transaction is initiated and the data for input to the three predictive models is prepared. These predictive models are run and the current transaction pattern is evaluated. The demonstration models determine if the current transaction is aligned with

previous patterns for this user with respect to transfer amounts, accounts used, failed login attempts, and so on. The models are run within the DB2 z/OS environment simply as SQL calls with no movement of data.

Next, the input to the business rule is prepared, and the business rule is invoked. All of the data resides in DB2 z/OS, and all of the analysis is performed without moving any data, resulting in extremely fast performance. If the fraud risk is determined to be "low," then two CICS banking transactions run to complete the transfer. If the fraud risk is determined as "high," then the transaction does not complete and a message is returned to the user indicating a reason for the incompleteness. All of this happens in real-time.

## Supported platforms

The following products mentioned in this solution guide run on IBM z13:

- DB2 for z/OS
- CICS
- IBM MobileFirst Platform Server (supported on IBM WebSphere® Application Server installed on Linux on z Systems only)
- IBM SPSS Predictive Analytics Enterprise
- IBM Business Process Manager Advanced for z/OS

## Ordering information

Contact your IBM representative for IBM z13 ordering information.

## Related information

For more information, see the following documents:

- *IBM z13 Technical Introduction*, SG24-8250  
<http://www.redbooks.ibm.com/abstracts/sg248250.html>
- IBM z13 product page  
<http://www.ibm.com/systems/z/hardware/z13.html>
- IBM Offering Information page (announcement letters and sales manuals):  
<http://www.ibm.com/systems/z/announcement.html>

# Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service. IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

*IBM Director of Licensing, IBM Corporation, North Castle Drive, Armonk, NY 10504-1785 U.S.A.*

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:** INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you. This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk. IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you. Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products. This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurement may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

## COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs.

**© Copyright International Business Machines Corporation 2015. All rights reserved.**

Note to U.S. Government Users Restricted Rights -- Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

This document was created or updated on January 8, 2015.

Send us your comments in one of the following ways:

- Use the online **Contact us** review form found at:  
[ibm.com/redbooks](http://ibm.com/redbooks)
- Send your comments in an e-mail to:  
[redbooks@us.ibm.com](mailto:redbooks@us.ibm.com)
- Mail your comments to:  
IBM Corporation, International Technical Support Organization  
Dept. HYTD Mail Station P099  
2455 South Road  
Poughkeepsie, NY 12601-5400 U.S.A.

This document is available online at <http://www.ibm.com/redbooks/abstracts/tips1259.html> .

## Trademarks

IBM, the IBM logo, and [ibm.com](http://ibm.com) are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. These and other IBM trademarked terms are marked on their first occurrence in this information with the appropriate symbol (® or ™), indicating US registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at <http://www.ibm.com/legal/copytrade.shtml>

The following terms are trademarks of the International Business Machines Corporation in the United States, other countries, or both:

CICS®	Redbooks®	z13™
Cognos®	Redbooks (logo)®	z/OS®
DB2®	SPSS®	zEnterprise®
IBM®	WebSphere®	z Systems™
Power Systems™		

The following terms are trademarks of other companies:

Linux is a trademark of Linus Torvalds in the United States, other countries, or both.  
Other company, product, or service names may be trademarks or service marks of others.