



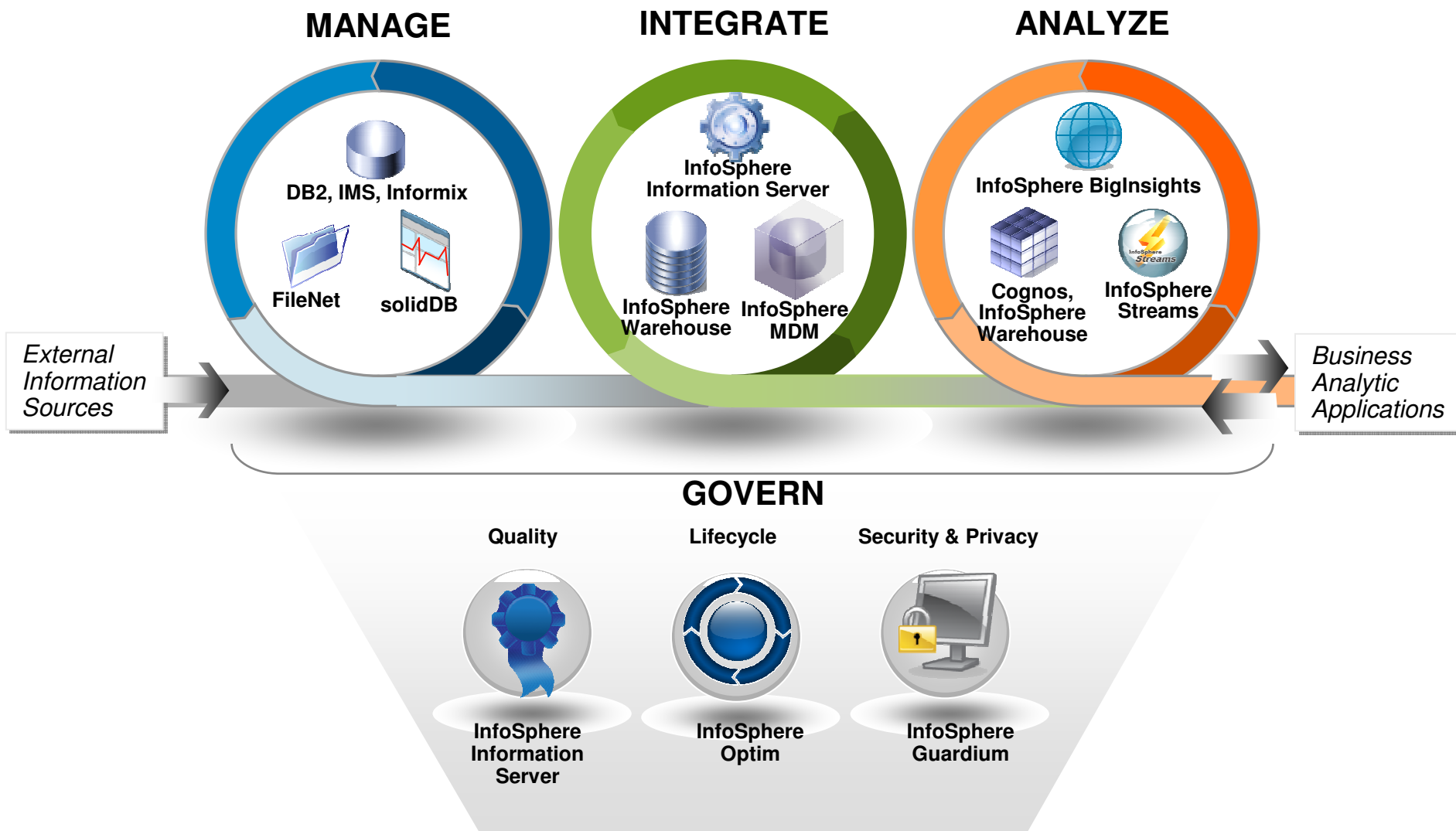
## Information Management on System z

Strategy and Direction for Leveraging Enterprise Data to Optimize Business Results

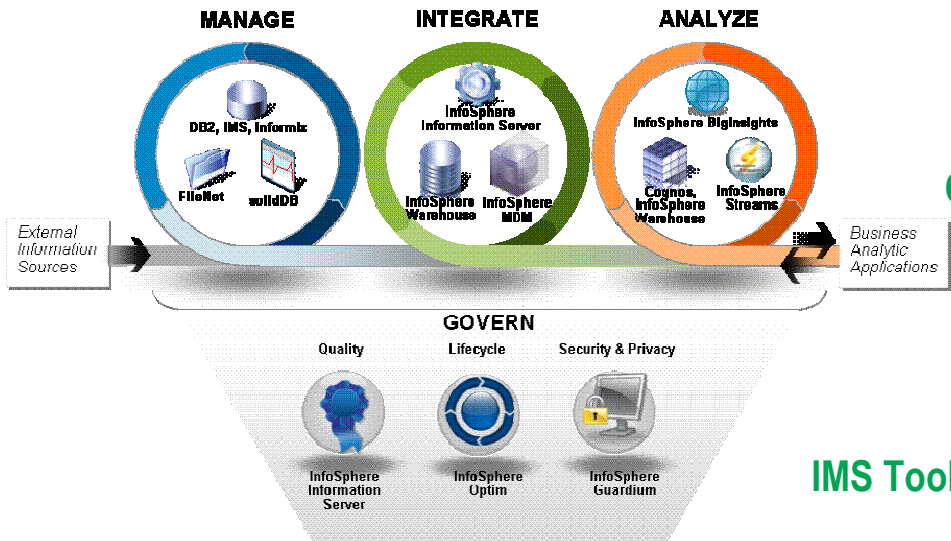
Dan Wardman  
Vice President,  
Information Management Mainframe Software  
Site Exec Silicon Valley Lab  
IBM Software Group



# Information Management Portfolio



# Information Management for System z



**2011**

- IMS 12
- Netezza for System z
- Active Active for z/OS
- Industry Models for System z
- Cognos 8 BI for z/OS
- Smart Analytics Optimizer for z/OS
- OMEGAMON DB2 end-to-end monitoring
- DB2 10 for z/OS
- DB2 Sort for z/OS
- Guardium for System z
- SPSS for System z
- ISAS 9600 for System z
- IMS Tools Solution Packs for z/OS

**2010**

- Analytics
- Information-Led Transformation

**2009**

- InfoSphere Discovery for z/OS
- InfoSphere Warehouse for System z
- Cognos 8 BI for System z
- InfoSphere MDM Server for System z
- Optim Data Governance for System z
- Information Server for System z
- Business Intelligence

**2008**

- Information Agenda
- Data Warehousing
- Information On Demand

*Over 50 Billion Transactions  
Per Day run through IMS*

## Investing in Innovation

**IMS 11**



Direct distributed access to IMS Data

- Reduces processing costs up to 67%

Easier Application Programming

- IMS DL/I knowledge not needed
- Java SQL support

On-line DB Reorganization

- 25% CPU Time Reduction

New Enterprise Suite

- Repackaging of IMS middleware
- Easier to order and install

*Generally Available  
October 30, 2009*

**Easier than Ever**



## IMS 11 Quality Partnership Program Results

- **12 Customers, 2 IBM internal sites, 30 vendors**
  - 6 customers running mission critical production prior to GA each running up to 80M transactions per day
  - 4 customers have entire enterprise in production on V11 prior to GA
  - 2 customers migrated with 100% availability using SHQ
  - Customer satisfaction scores higher than V10

***IMS 11...GA October 30, 2009 and already running over***

***200 Million Transactions per Day***



# Announcing IMS 12!

- We are excited to announce the start of the IMS 12 Quality Partnership Program
- IMS 12 will offer:

## Reduced Costs!

- Up to **10%** out of the box MIPS savings
- Up to **30%** savings on network support

## Improved Productivity!

- Up to **50%** faster deployment of IMS resource definitions and changes using the **IMS Explorer**
- Ability to create PLI code from WDSL for rapid application development

## Improved Performance!

Database logging up to **2x** faster

## Growth Enablement!

Additional storage constraint relief and dynamic change capabilities





❖ *Scotiabank had several objectives focused on enterprise modernization: eliminate costs associated with IBM Communication Servers and SNA LUs; significantly reduce proprietary transaction chaining; improve business function response times and transaction performance; and position IMS applications as first-class players in enterprise SOA solutions.*

## Business Challenge

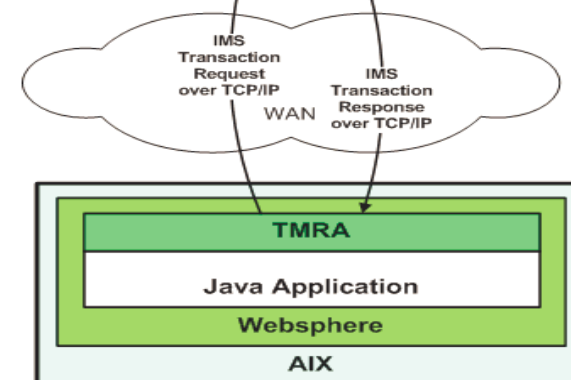
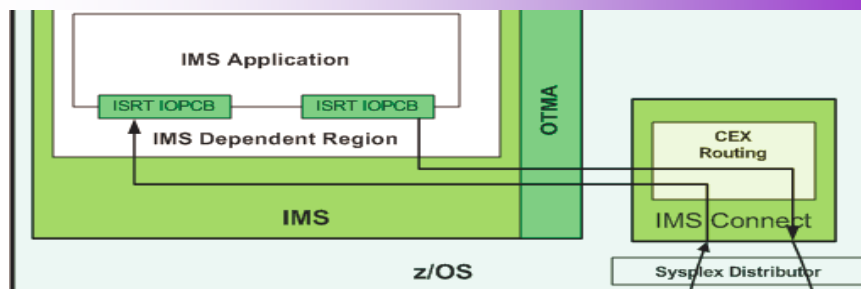
## Solutions

- ❖ *IMS Connect and IMS commit processing (CM1)*
- ❖ *WebSphere Java applications access IMS using the IMS TM Resource Adapter*
- ❖ *IMS TM Resource Adapter implements sophisticated connection pooling for support of persistent socket connections*
- ❖ *IMS Connect and TM Resource Adapter support SSL, allowing for Client and Server-side certificate-based SSL connections.*
- ❖ *Execute various operational scenarios including planned and unplanned “downs” for the network, IMS, IMS Connect, and IMS dependent regions*

"We are extremely pleased with the results regarding installation, configuration, tuning, new processes, operations management, and security management." Craig Oddy, Operations, Scotiabank

## Benefits

- ❖ *MIPS utilization, response times, switchover/failover and recovery, and mid-tier metrics all tested to expectations.*





## Business Challenge

- ❖ *Transition Green Screen conversational applications to Web based GUI Screen applications*
- ❖ *SOA Enable a Ford IMS MFS Conversational Transaction*
- ❖ *Manage and Monitor the performance and capacity needs*

## Solution

- ❖ *Ford's IMS Applications are Conversational and are dependent upon the statefull data resident in the IMS Scratch Pad Area (SPA). IBM is working on a method to maintain the SPA data when executing long running business processes from within WebSphere Process Server*

## Benefits

- ❖ *Reuse existing business processes and data*
- ❖ *Modernize the User Interface of CORE Applications without re-writing code*
- ❖ *Reduce Cost for Application Development and Delivery efforts*





# Nationwide®

## ***Business Challenges***

- ❖ *Provide high availability of existing insurance data across a wide customer base*
- ❖ *Manage high volume of internal and external customer transactions*
- ❖ *Ensure standing in competitive marketplace*

## ***Solutions***

- ❖ *Use IMS TM to achieve high performance transaction throughput at lowest cost*
- ❖ *Use IMS Block Level Data Sharing to meet high availability requirements and growth demands*
- ❖ *Investigate use of IMS Shared Queues for effective workload balancing*

## ***Benefits***

- ❖ *Efficient, high performance processing of business transactions*
- ❖ *High availability of insurance data*
- ❖ *Scalable environment to handle business growth*



## Business Challenge

❖ *Connect IMS applications with distributed applications tracking manufacturing materials across the enterprise, to maintain the currency of data in both systems.*

## Solutions

- ❖ *Implement the IMS SOAP Gateway on z/OS.*
- ❖ *Implement both asynchronous and synchronous Callout from IMS programs.*
- ❖ *Implement IMS V11 With ODBM*

- *“IMS “Callout”, ODBM, and the SOAP Gateway allow us to keep data in distributed systems in “sync” with that in the legacy IMS systems, helping maintain inventory control.”*

*Steve Clanton  
IT Transactional Services, Caterpillar Inc.*

## Benefits

❖ *Data for tracking materials is updated between systems allowing better control of inventory and eliminating waste.*



## Handelsbanken

### Business Challenge

❖ *For Handelsbanken customer satisfaction is a priority . Handelsbanken needed a reliable and secure back-end systems to support their global 24x7 online banking business. In addition, the bank was determined to achieve milliseconds execution time for their ATM and POS transactions.*

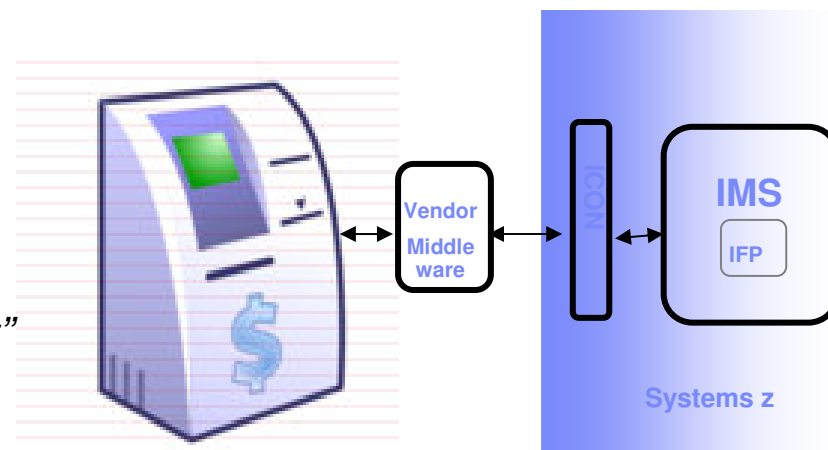
### Solutions

- ❖ *Run ATM and POS as Fast Path transaction thru IMS Connect*
- ❖ *Leverage Geographically Dispersed Parallel Sysplex (GDPS) for data integrity*
- ❖ *Achieve high availability by using IMS and DB2 datasharing in a Parallel Sysplex environment.*
- ❖ *Install WAS, MQ and DB2 within the same partition as IMS for scalability and security*

*“By reusing our IMS applications, we are able to sustain a high return on our IMS investment”*  
 Curt Bergkvist, IMS Technical Specialist,  
 Handelsbanken

### Benefits

- ❖ *Global, 24x7 customer satisfaction for Handelsbanken e-banking services and instant response time for all ATM and POS transactions*





## Business Challenge

- *Redundant transaction manager infrastructure for core banking applications as result of BBK and CajaSur bank merger*
- *Potential system bottleneck due to a single gateway to backend core IMS system for multichannel applications*

## Solutions

- *Consolidate different Transaction Manager Systems into IMS systems*
- *Enhance IMS connectivity to handle additional workload by installing another IMS Connect instance and exploiting IMS Connect super member support*

## Benefits

- *Expected cost reduction due to single and consistent IMS infrastructure for core banking applications across the enterprise*
- *Improved availability for multichannel applications via enhanced connectivity*
- *Workload isolation for ATMs, POS, online banking and branch offices applications*

# IMS Regional User Groups World-wide

Free technical education; network with other IMS customers

## Americas

- Boston, MA
- Chicago, IL
- Cincinnati, OH
- Columbus, OH
- Costa Mesa, CA
- Dallas, TX
- Detroit, MI
- Glendale, CA
- Hartford, CT
- Jacksonville, FL
- Minneapolis, MN
- NY, NY
- Omaha, NE
- Philadelphia, PA
- Phoenix, AZ
- San Ramon, CA
- Sao Paulo, Brazil
- Seattle, WA
- Springfield, IL
- Tampa, FL
- Toronto, Canada
- Washington, DC
- Vancouver, Canada
- Victoria, BC



## EMEA& AP

- Amsterdam
- Brussels
- Copenhagen
- Chennai
- Dusseldorf
- Helsinki
- Johannesburg
- Madrid
- Melbourne
- Munich
- Oslo
- Stockholm
- Stuttgart
- Sydney
- Taipei

# DB2 for z/OS Technical Strategy

- Extend the lead in availability, scalability and performance.
  - Parallel Sysplex: the best scale-out solution in the industry
  - Tight integration between DB2 and the System z hardware and z/OS operating system
  - Advanced solutions for compliance with data security and privacy regulations
  - Workload consolidation: System z is the ultimate consolidation platform
  - Eliminate all causes of outages
- Reduce cost of ownership
  - Database technology that can handle large workloads with fewer people
  - Storage and CPU optimization, including specialty engines
  - Advanced autonomies to make the system more self-managing and self-tuning
- Application enablement
  - Apps can easily connect to DB2 from anywhere
  - Advanced SQL, XML capability, application portability
- Improved data warehousing capabilities

# DB2 10 for z/OS At a Glance

Application Enablement	<ul style="list-style-type: none"> <li>• pureXML enhancements</li> <li>• Temporal queries</li> <li>• Last Committed reads</li> <li>• Timestamp with timezone</li> <li>• SQL improvements that simplify porting</li> </ul>
RAS, Performance, Scalability, Security	<ul style="list-style-type: none"> <li>• Wide range of performance improvements</li> <li>• More online schema changes</li> <li>• Catalog restructure for improved concurrency</li> <li>• Fine grained access control</li> <li>• Hash access to data</li> <li>• New DBA privileges with finer granularity</li> </ul>
Simplification, Reduced TCO	<ul style="list-style-type: none"> <li>• Full 64-bit SQL runtime</li> <li>• Auto stats</li> <li>• Data compression on the fly</li> <li>• Query stability and management enhancements</li> <li>• Reduced need for REORG</li> <li>• Utilities enhancements</li> </ul>
Data Warehousing	<ul style="list-style-type: none"> <li>• Moving sum, moving average</li> <li>• Many query optimization improvements</li> <li>• Query parallelism improvements</li> <li>• Advanced query acceleration</li> </ul>

## DB2 10 for z/OS: Out-of-the-Box Savings

### Up to 20% CPU reductions for transactions, queries, and batch

- Out-of-the-box CPU reductions of 5-10% for traditional workloads
- Out-of-the-box CPU reductions of up to 20% for new workloads
- Up to additional 10% CPU savings using new functions

### Scales with less complexity and cost

- 5-10x more concurrent users – up to 20,000 per subsystem
- Significant scale-up capabilities in addition to existing scale-out support
- Consolidate to fewer LPARs and subsystems

### Improved operational efficiencies and lower administration cost

- Automatic diagnostics, tuning, and compression

### Even better performance

- Elapsed time improvement for small LOBS and Complex Queries

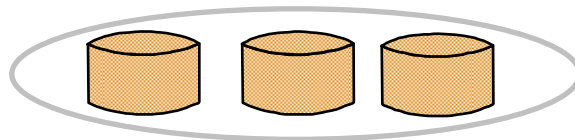
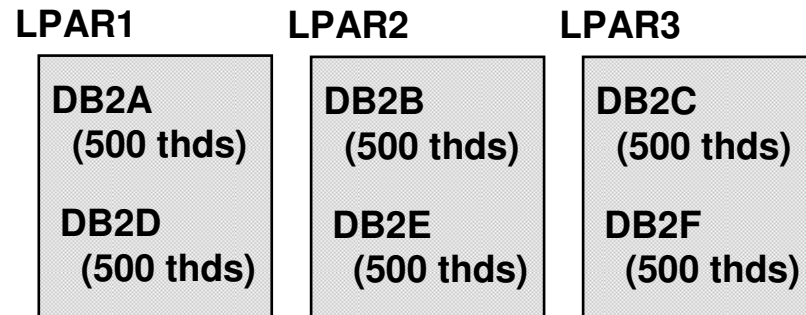




# Running a Large Number of Threads

## Today

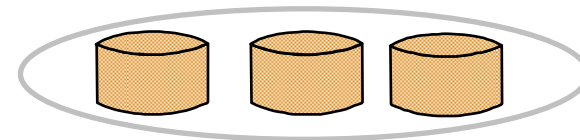
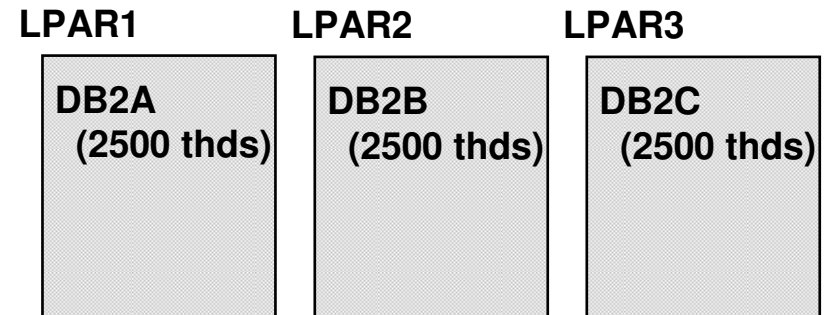
Coupling Technology



- Data sharing and sysplex allows for efficient scale-out of DB2 images
- Sometimes multiple DB2s / LPAR

## DB2 10

Coupling Technology



- More threads per DB2 image
- Potential for fewer members / LPARs
- More efficient use of large n-ways
- SSI constraints are relieved
- Easier growth, lower costs, easier management
- Data sharing required for continuous availability and XL scale

# Temporal Data – Need to Query ‘AS OF’

## Temporal Query & Business Timestamp

- **Table-level specification to control data management based upon time**
- **Two notions of time:**
  - **System time:** notes the occurrence of a data base change
    - “row xyz was deleted at 10:05 pm”
    - Query at current or any prior period of time
    - Useful for auditing and compliance
  - **Business time:** notes the occurrence of a business event
    - “customer xyz’s service contract was modified on March 23”
    - Query at current or any prior/future period of time
    - Useful for tracking of business events over time, application logic greatly simplified
- **New syntax in FROM clause to specify a time criteria for selecting historical data**



## DB2 10 for z/OS: Savings and performance

- Up to 40% savings in processing costs
- Up to 6 times the number of SAP users on a single system
- Time Travel temporal capabilities built directly into the database
- Direct Row access accelerates high performance applications



*"We have measured a 38% reduction in CPU for heavy insert workloads in a data sharing environment. That's a significant savings which provides immediate business benefit."*

*Peter Paetsch, BMW Group*

*We expect to reduce our data sharing requirements by 25%, which means less system, storage and resource expenses*

*Banco do Brasil*



**Major Insurance Company**

*The new temporal functionality in DB2 10 for z/OS will allow us to drastically simplify our data-related queries and reduce our processing cost by having DB2 handle data movement more efficiently than our custom code*

*"As much as 80% of our applications can use this, which will drastically save developer time and even more importantly make applications easier to understand to improve business efficiency and effectiveness"*

**bankdata**

*"In addition to the cost savings, DB2 10 for z/OS offers a far superior data server environment than Oracle"*

*Manuel Gomez Burrierl, CECA (Spanish Bank Federation)*



*As a multi-national corporation, we must adhere to strict local audit requirements. The security and administration capabilities in DB2 10 are a key driver for us to move to this version."*





## Jump into DB2 10! The water's fine.



DB2 V8

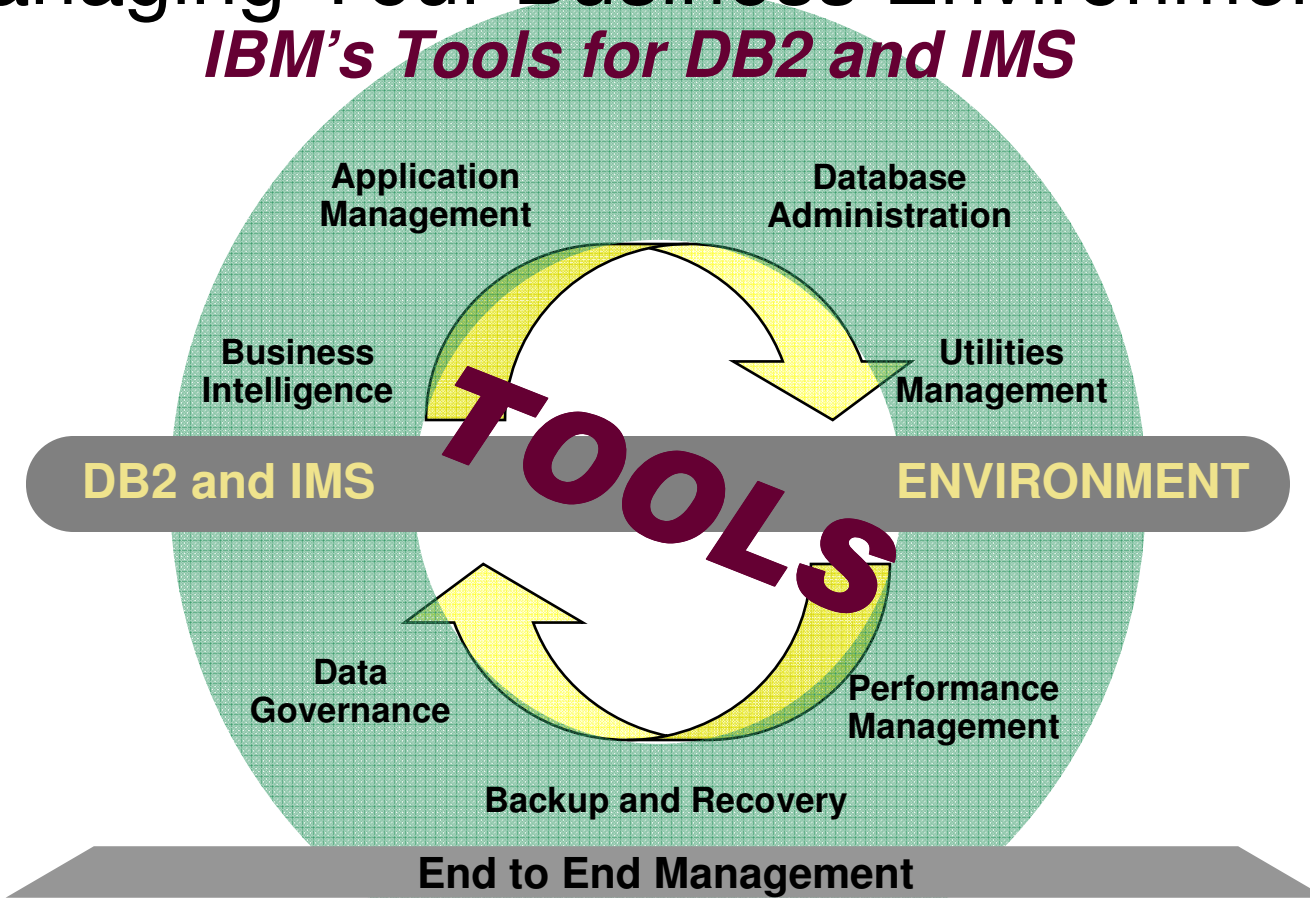
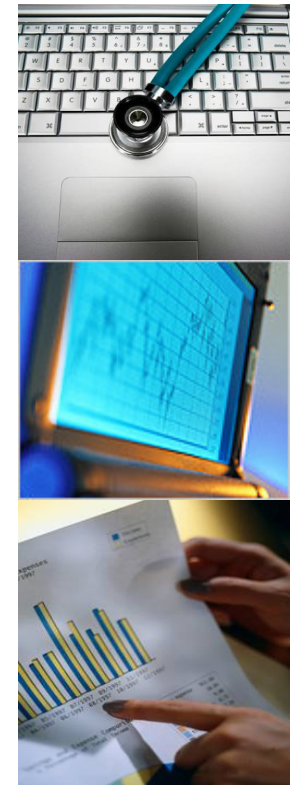
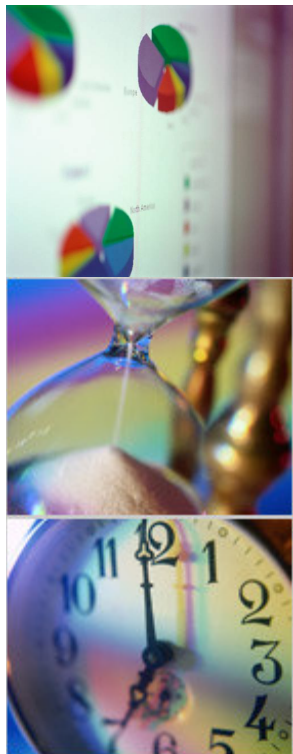
DB2 9

DB2 10

Key Questions are WHEN? and HOW?

# Managing Your Business Environment

## *IBM's Tools for DB2 and IMS*



**ROI**

### ***Business Challenges***

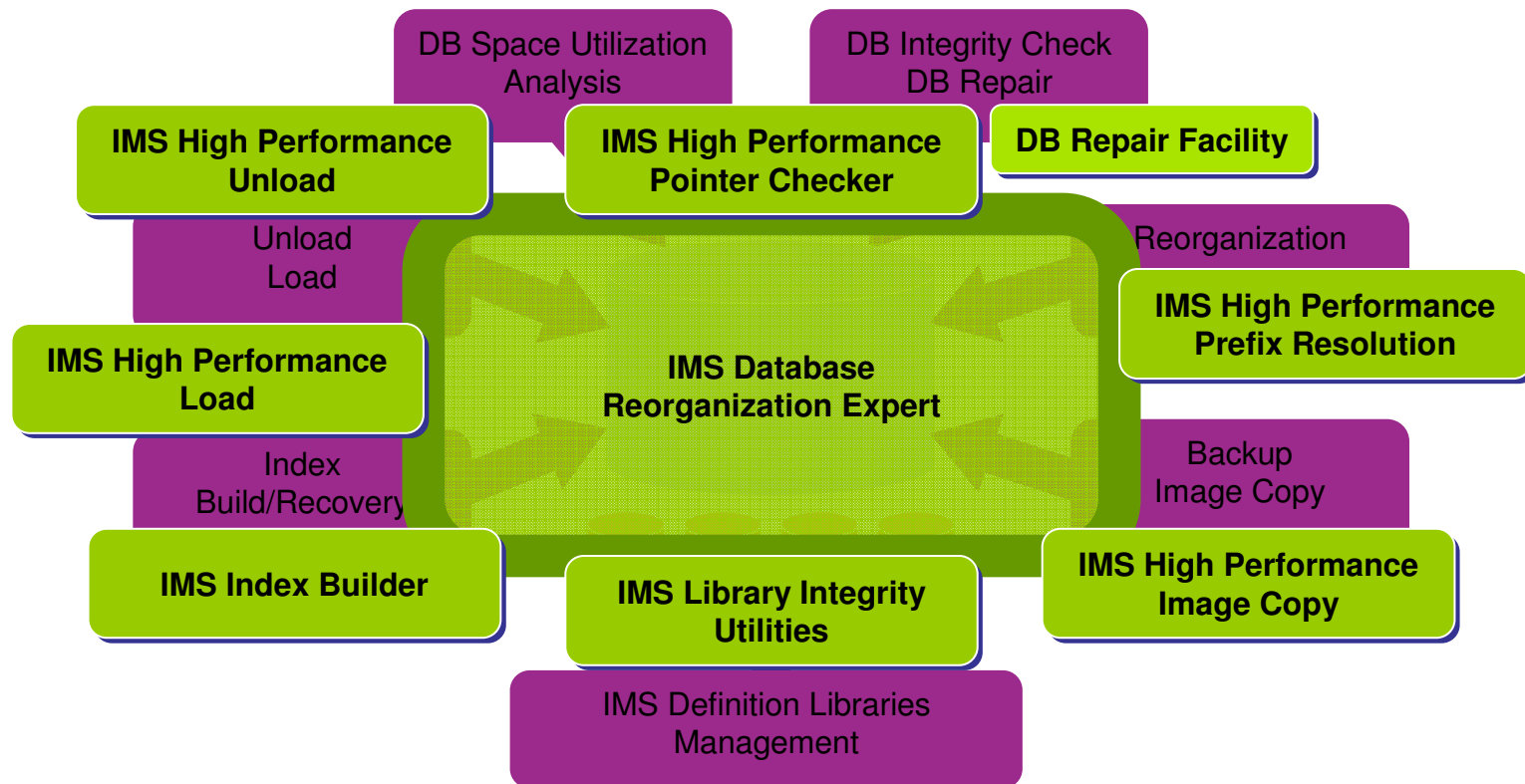
- Optimizing costs associated with maintaining existing applications
- Quickly responding to new business requirements and opportunities
- Ensuring that business and regulatory needs can be properly met
- Maximizing IT staff productivity to streamline business operations

**Resiliency**



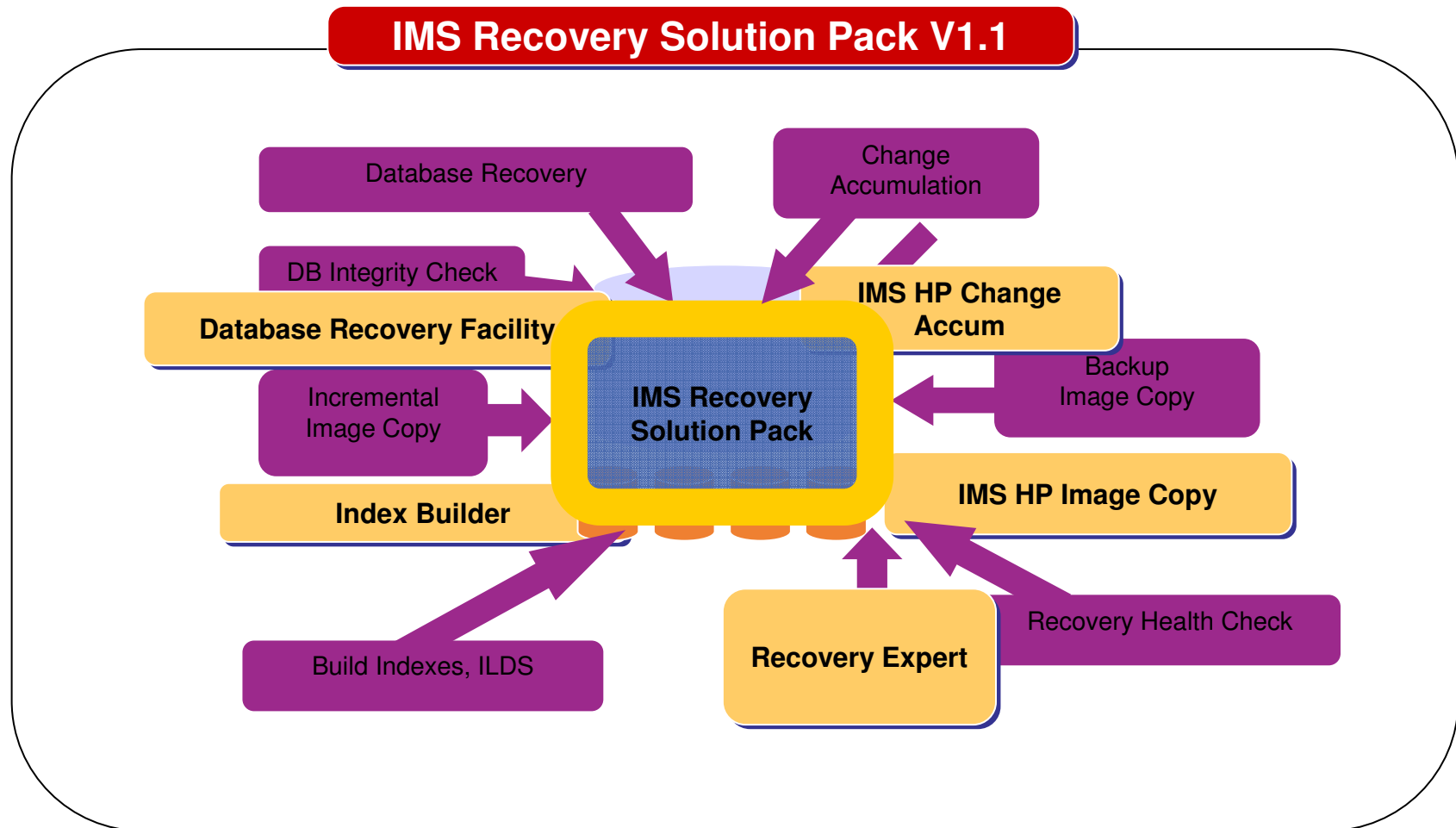
## DB Solution Pack helps daily DBA tasks

- DB Solution Pack provides a complete set of high performance tools to unload, load, reorganize, build indexes for, backup, verify, and report on full-function databases



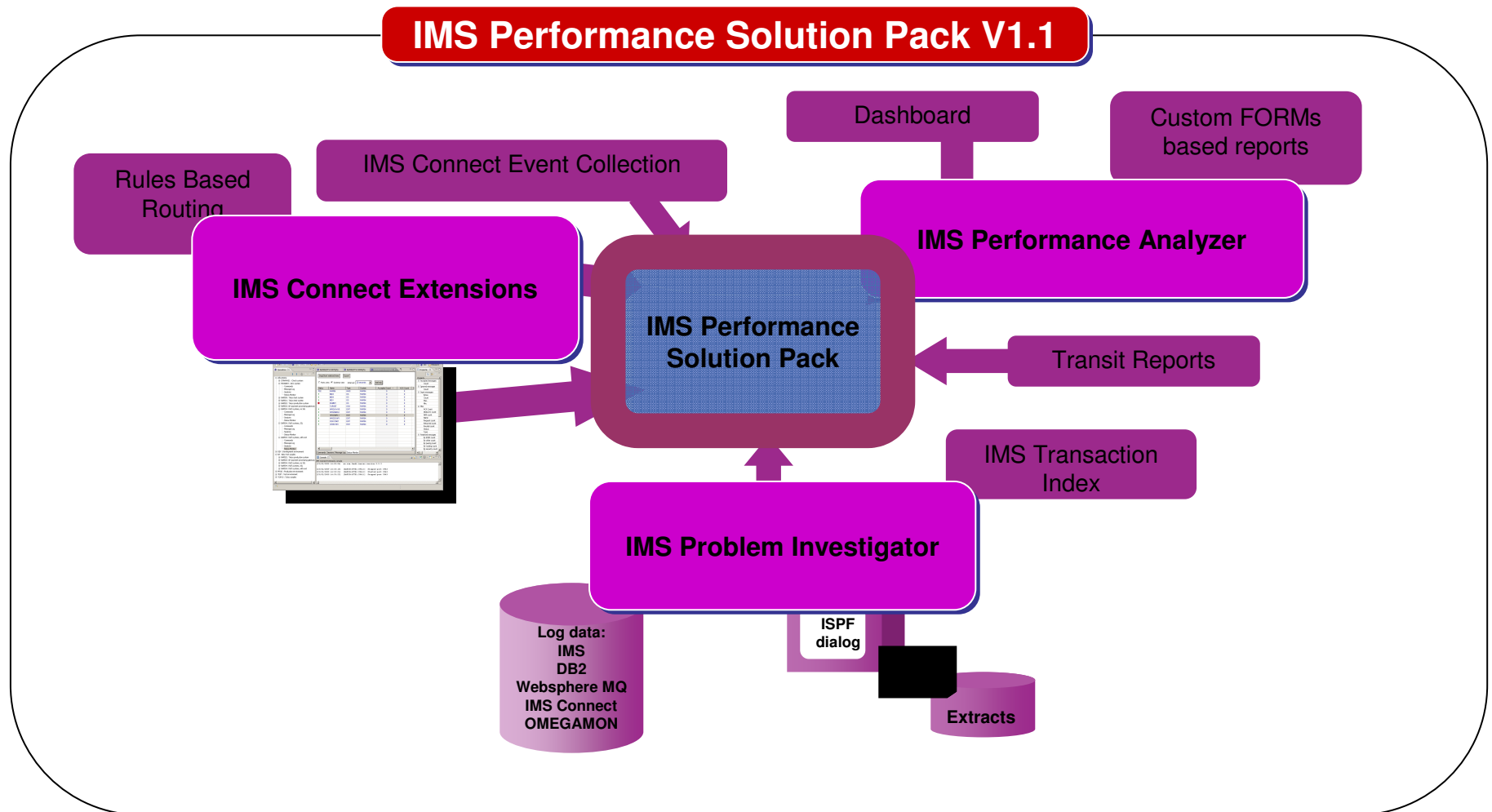


# A comprehensive solution for your Backup and Recovery needs





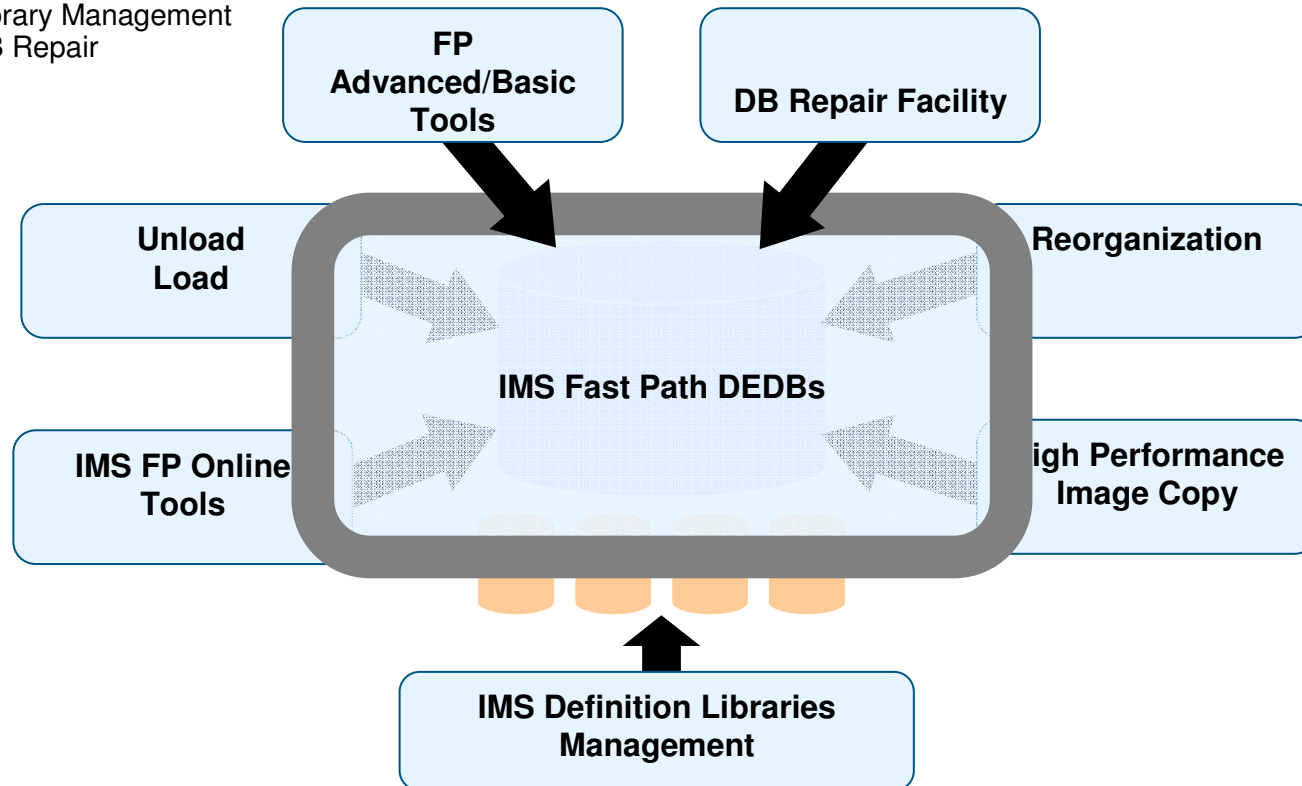
# A solution for IMS Performance Management





# Fast Path Solution Pack helps daily DBA tasks

- **Provides a complete set of high performance utilities for Fast Path databases**
  - Unload, reload, reorganize, backup, verify and report on DEDB areas and tune-up the libraries
- **Saves time and money - reduces resources (CPU and elapsed time)**
  - Parallel processing of DEDB multiple areas in a single step
  - Eliminates I/O for intermediate data sets by enabling multiple utilities tasks to run in a single step
  - Reduces the unavailability time of taking data base image copy using advanced technology
- **Provides online features for improved system availability**
  - Reorganize, extract, extend, backup, verify and report on “online” DEDB areas
- **Completes the Fast Path solution with other valuable utilities:**
  - Image Copy
  - Library Management
  - DB Repair





# IBM DB2 Tools: *Are you ready for DB2 10?*

- Exploit DB2 10 performance savings out-of-the-box
- Optimize Performance Across Multi-Platform Applications
- Lower CPU costs while reducing batch windows
- Higher data availability through simplified recovery operations



## All New with DB2 10!

**DB2 Utilities Suite 10** drives down costs with *autonomics, page sampling and further offloads processing to zIIPs and FlashCopy. Developed in conjunction with DB2 10 to provide maximum data integrity and exploit all new functions out of the box.*

**DB2 Administration Tool/Object Compare 10.1** extends the value of DB2 10 with new capabilities that allow DBAs to quickly exploit DB2 10 features like *schema evolution. Reduces the overhead of many routine tasks.*

**DB2 Sort 1.1** lowers the cost of DB2 Utility sort processing by exploiting advanced features of *System z and z/OS while optimizing overall system efficiency. Significantly reduces batch windows.*

**Tivoli OMEGAMON XE for DB2 Performance Expert 5.1** extends its insight into distributed workloads and offers a *robust infrastructure to support DB2 10 subsystem consolidation, with lower monitoring overhead. The recommended performance monitor of DB2 10!*

**QMF 10** delivers built-in visualizations and reports that dramatically extend the value to end users. *A new metadata layer simplifies the process to understand and create reports.*

**DB2 High Performance Unload 4.1** reduces the cost of extracting DB2 10 data with support for *TCP/IP Pipes and the new internal format as well as a new native XML data unload capability.*



# Administer DB2 10 Performance Savings

## DB2 Administration Tool 10.1 Exploitation

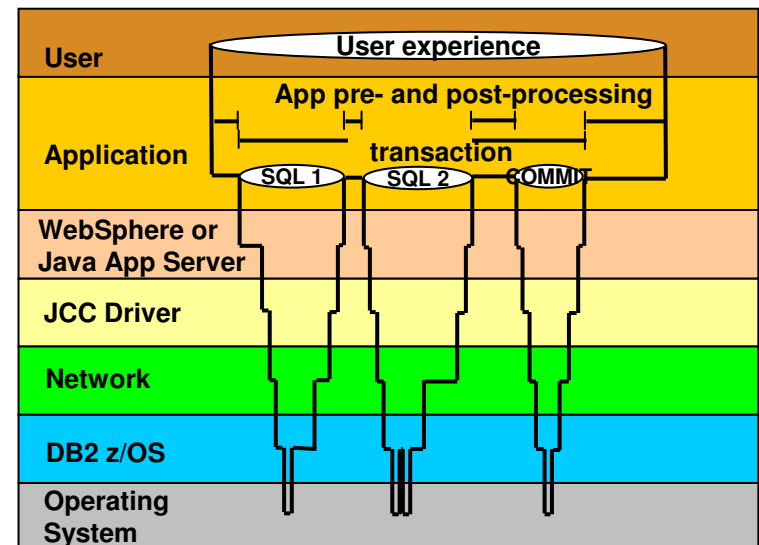
- **Drive immediate DB2 10 out-of-the-box Performance Savings**
- **Exploit DBA-managed Performance Improvements**
  - Include additional Columns in Indexes to Exploit Index Only Access
  - Convert LOBs to in-line to boost performance
- **Extend Administration Capabilities**
  - Manage new Security models
  - Reduce Schema change overhead
  - Manage Autonomic Statistics collection
- **Time Travel with Temporal Data – “as of”**
  - Record changes in history – System Time
  - Define, update and query events in past or future – Business Time
  - Browse Temporal Data “as of” a point in time with DB2 Table Editor 4.3
- **Plus New Features for DB2 V8, 9 & 10**
  - New “ALT” command to intelligently drive schema changes
  - “NOPAD” option to improve performance with VARCHAR data
  - Recover from Access Path regressions with DB2 9 & 10 Plan Management



# Optimize Dynamic Infrastructure Performance

## OMEGAMON XE for DB2 Performance Expert 5.1 Exploitation

- **Extended Insight**
  - Surface DB2 for z/OS end-to-end response time metrics
    - Visibility to **all** the components that make up end-user response time
    - Facilitates platform-agnostic identification of response time bottlenecks
    - Enables near-instantaneous response to and prevention of application slowdowns
  - Leverages Tivoli Enterprise Portal GUI
  - Support DB2 9 & 10
  
- **Summary SQL Reporting**
- **Manage thousands of Threads**
- **Support new DB2 10 Monitoring Data**
- **Lower Monitoring Overhead**





# Drive DB2 10 Efficiency & Productivity

## DB2 Automation Tool 3.1 Exploitation

- **Autonomic Statistics**
  - Exploit real-time, sampling driven Statistics collection
  - Invoke RUNSTATS with new Profile option
  - Interface with existing Job Schedulers
- **FlashCopy Image Copy**
  - Reduce Batch-windows
  - Reduce CPU consumption with Storage-based Backups
  - Drive improved Recovery Time Objectives
- **Avoid Unnecessary Reorgs**
  - Set REORG thresholds based on DB2 10 Best Practices
  - Detect when Indexes are insensitive to Clustering
  - Avoid REORGs for poorly structured Indexes

## Exploit Online Reorgs with DB2 Utilities Enhancement Tool 2.1

- Define policy to cancel Threads immediately before Switch Phase
- Exploit REORG Force option to eliminate Drain Failures
- No changes required to REORG Jobs



# Drive DB2 9 & 10 Efficiency & Productivity

## DB2 Sort 1.1

- Significant CPU and Elapsed Time reduction in Sort
  - LOAD, REORG, RUNSTATS, REBUILD INDEX, CHECK INDEX, CHECK DATA
  - Presort from DB2 Utilities Enhancement Tool for LOAD REPLACE
- Unique API to allow authorized utilities to invoke the sorting software
- Valuable for customers with large amount of data and aggressive SLA's

## Internal Format for up to 4x Load Performance Improvements

- DB2 UNLOAD & LOAD Utilities
- DB2 High Performance Unload 4.1
- Exploit with DB2 Utilities Enhancement Tool 2.1 Constant & Valuelf Options

## Unload and Load DB2 Data via USS Pipes & TCP/IP

- DB2 UNLOAD & LOAD Utilities
- DB2 High Performance Unload 4.1

## Fast XML Data Unload

- DB2 High Performance Unload 4.1



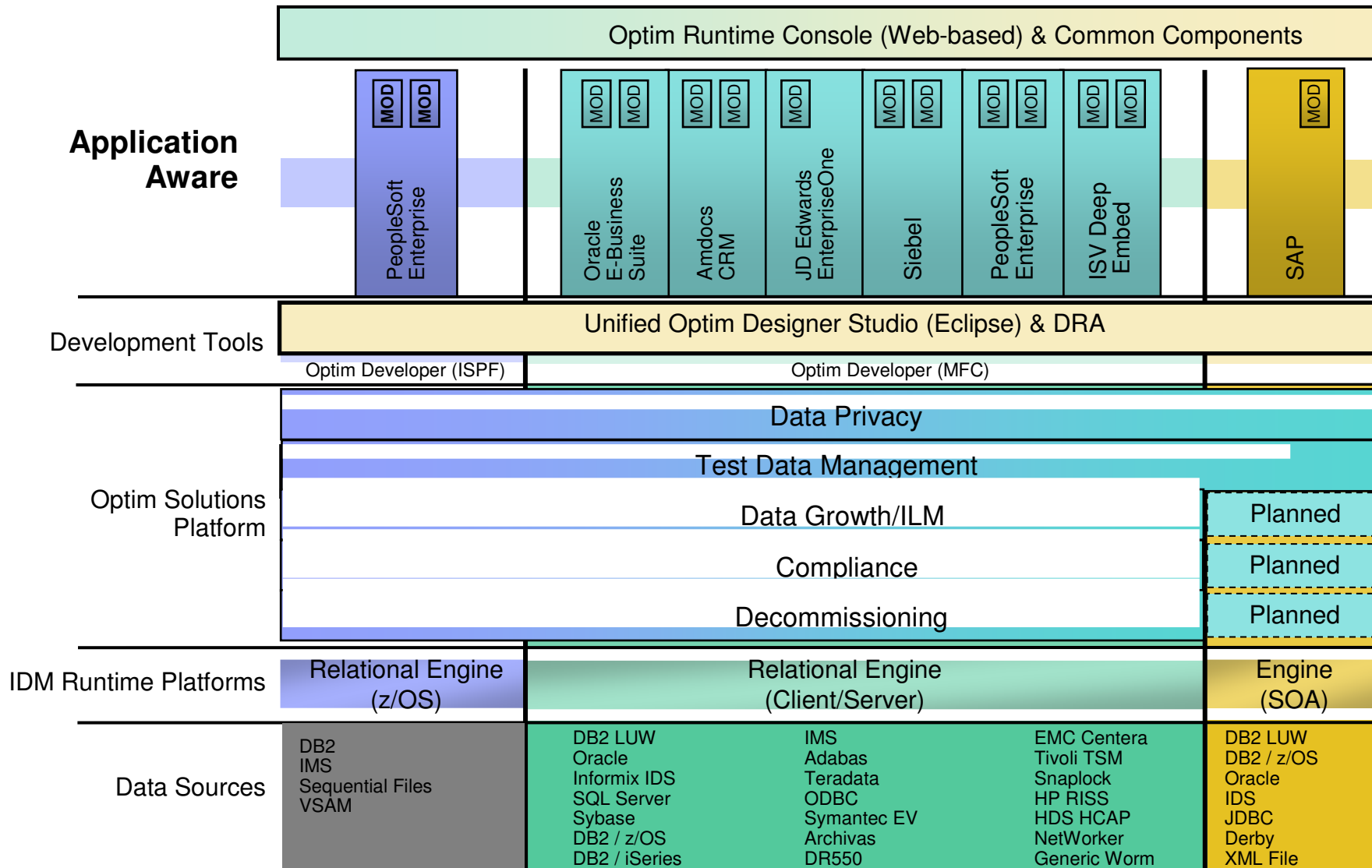
# Exploit DB2 10 for z/OS with IBM DB2 Tools

*Accelerate your ability to leverage compelling DB2 10 features with comprehensive Tools support*

- Data Encryption Tool for IMS and DB2 Databases
- DB2 Administration Tool / DB2 Object Compare for z/OS
- DB2 Automation Tool for z/OS
- DB2 Bind Manager for z/OS
- DB2 Change Accumulation Tool for z/OS
- DB2 Cloning Tool for z/OS
- DB2 High Performance Unload for z/OS
- DB2 Log Analysis Tool for z/OS
- DB2 Object Restore for z/OS
- DB2 Path Checker for z/OS
- DB2 Query Management Facility for z/OS
- DB2 Query Monitor for z/OS
- DB2 Recovery Expert for z/OS
- DB2 SQL Performance Analyzer for z/OS
- DB2 Table Editor for z/OS
- DB2 Utilities Enhancement Tool for z/OS
- DB2 Utilities Suite for z/OS
- InfoSphere Change Data Capture
- InfoSphere Data Event Publisher
- InfoSphere Guardium S-TAP for DB2 on z/OS
- InfoSphere Replication Server
- Optim Data Growth Solution for z/OS
- Optim Development Studio
- Optim pureQuery Runtime
- Optim Query Workload Tuner
- Optim Test Data Management Solution for z/OS
- Tivoli OMEGAMON XE for DB2 Performance Expert on z/OS

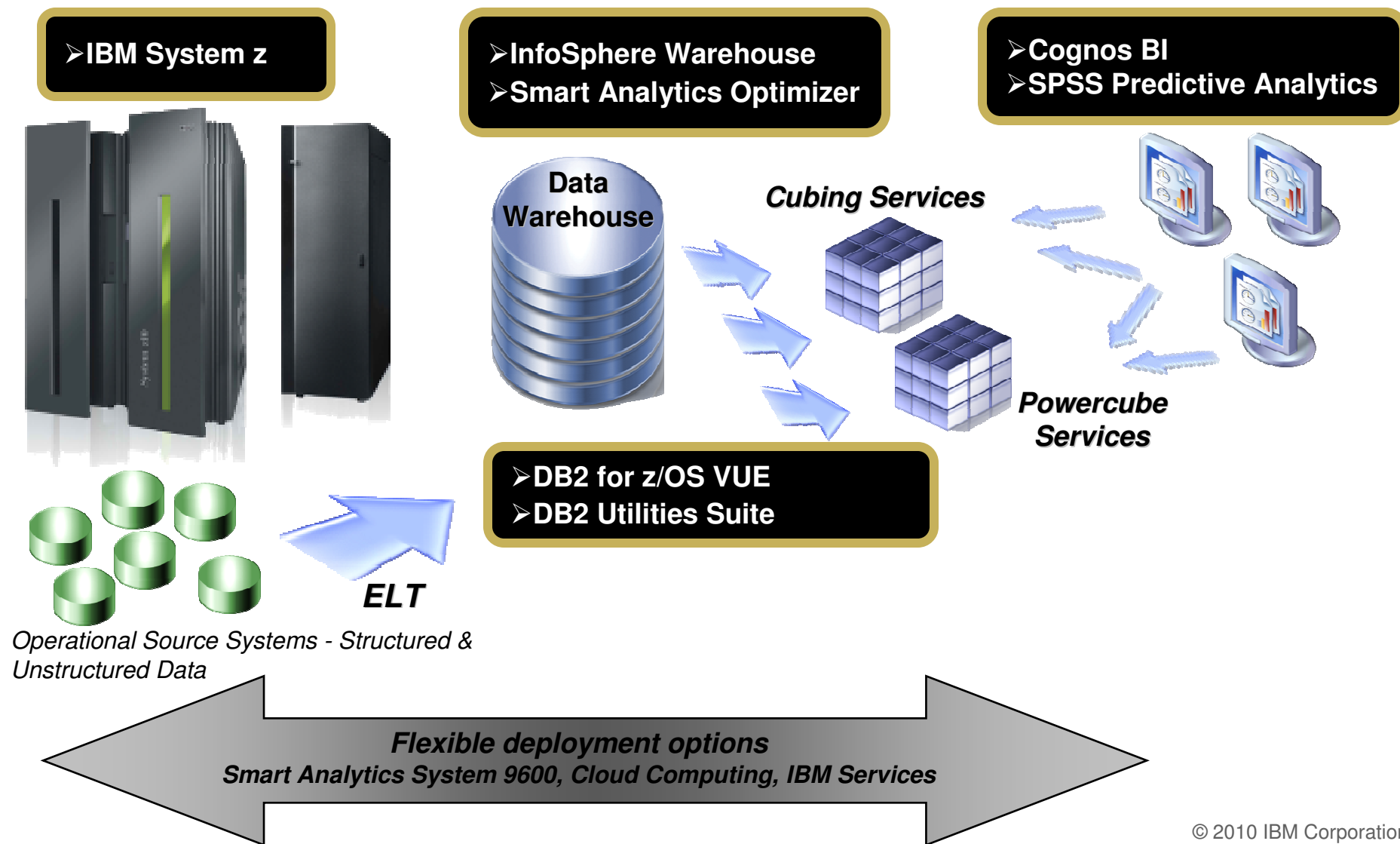


# Optim Product Portfolio- (Q4 2009 – Q1 2010 for Privacy, Archiving, Decommissioning and TDM)





# End to End Business Analytics & Data Warehousing Solution on a single platform



# IBM Cognos Business Intelligence for Linux on System z



- **Full range of BI capabilities**

- Query, reporting, analysis, dashboarding, realtime monitoring

***Business Analytics***

- **Delivers information where, when and how it is needed**

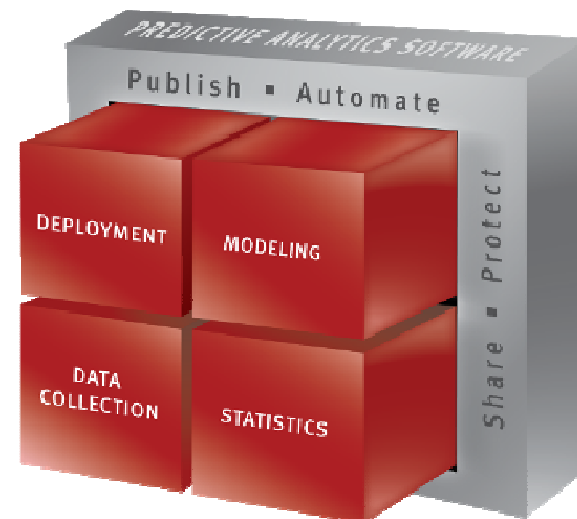
- Self-service reporting and analysis
- Automated delivery of information in context
- Author once, consume anywhere

- **Purpose-built SOA platform**  
that fits client environments and scales easily

# IBM SPSS

- **Full breadth of predictive analytics**
  - Data collection, statistics, data mining, predictive modeling, deployment services...
- **Putting prediction in hands of the business**
  - Decision Management
- **Driving better business outcomes**
  - Attract and retain more profitable customers
  - Detect and prevent fraud
  - Improve resource allocation

**Business Analytics**



# IBM Smart Analytics Optimizer

*Capitalizing on the best of relational and columnar databases*

## **What is it?**

*The IBM Smart Analytics Optimizer is a workload optimized, appliance-like add-on that enables the integration of business insights into operational processes to drive winning strategies. It accelerates select queries, with unprecedented response times.*



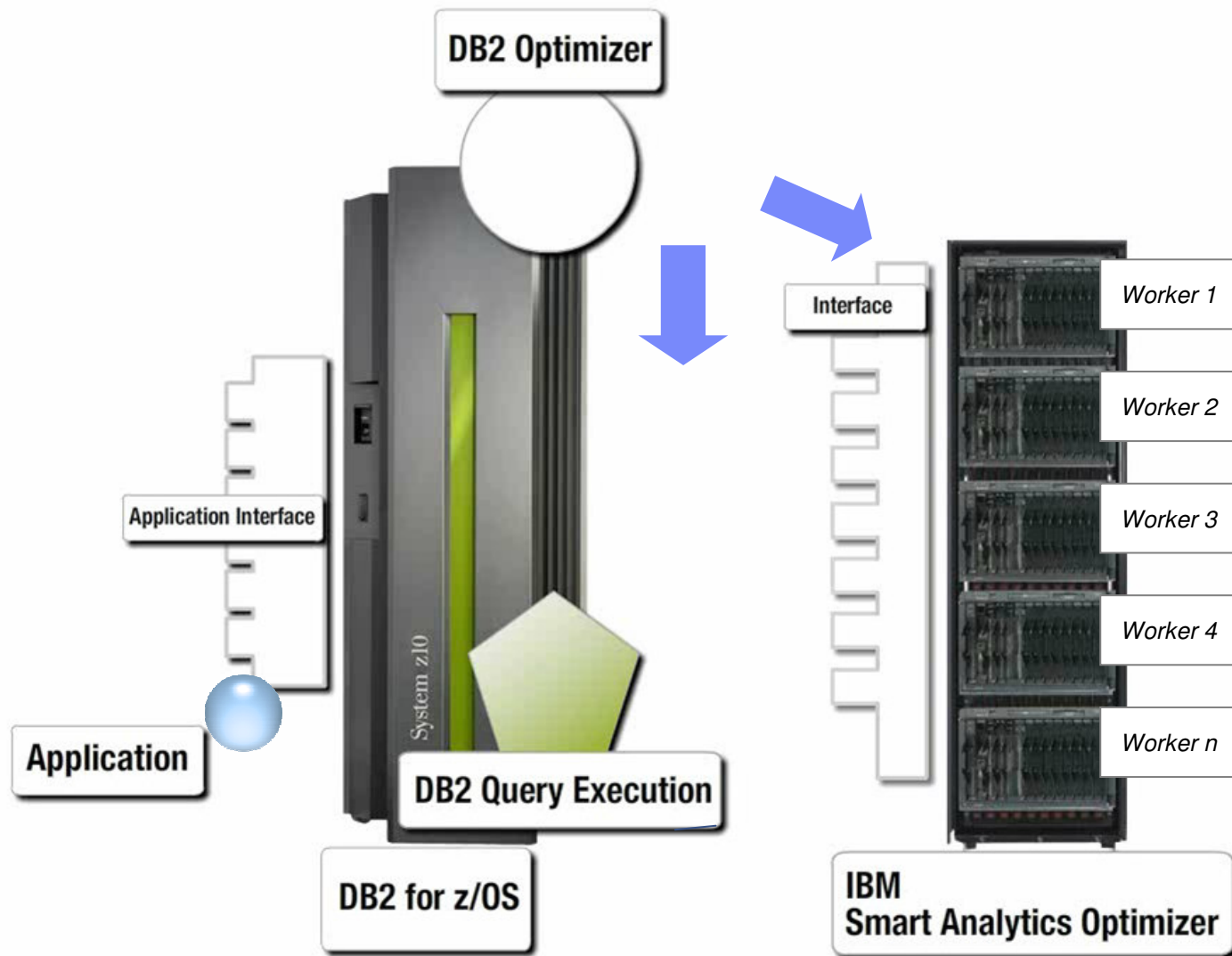
**Data  
Warehousing**

## **How is it different?**

- **Performance:** Unprecedented response times to enable 'train of thought' analyses frequently blocked by poor query performance.
- **Integration:** Connects to DB2 through deep integration, providing transparency to all applications.
- **Self-managed workloads:** queries are executed in the most efficient way
- **Transparency:** applications connected to DB2 are entirely unaware of the accelerator
- **Simplified administration:** appliance-like hands-free operations, eliminating many database tuning tasks

**Breakthrough Technology Enabling New Opportunities**

# Query Execution Flow



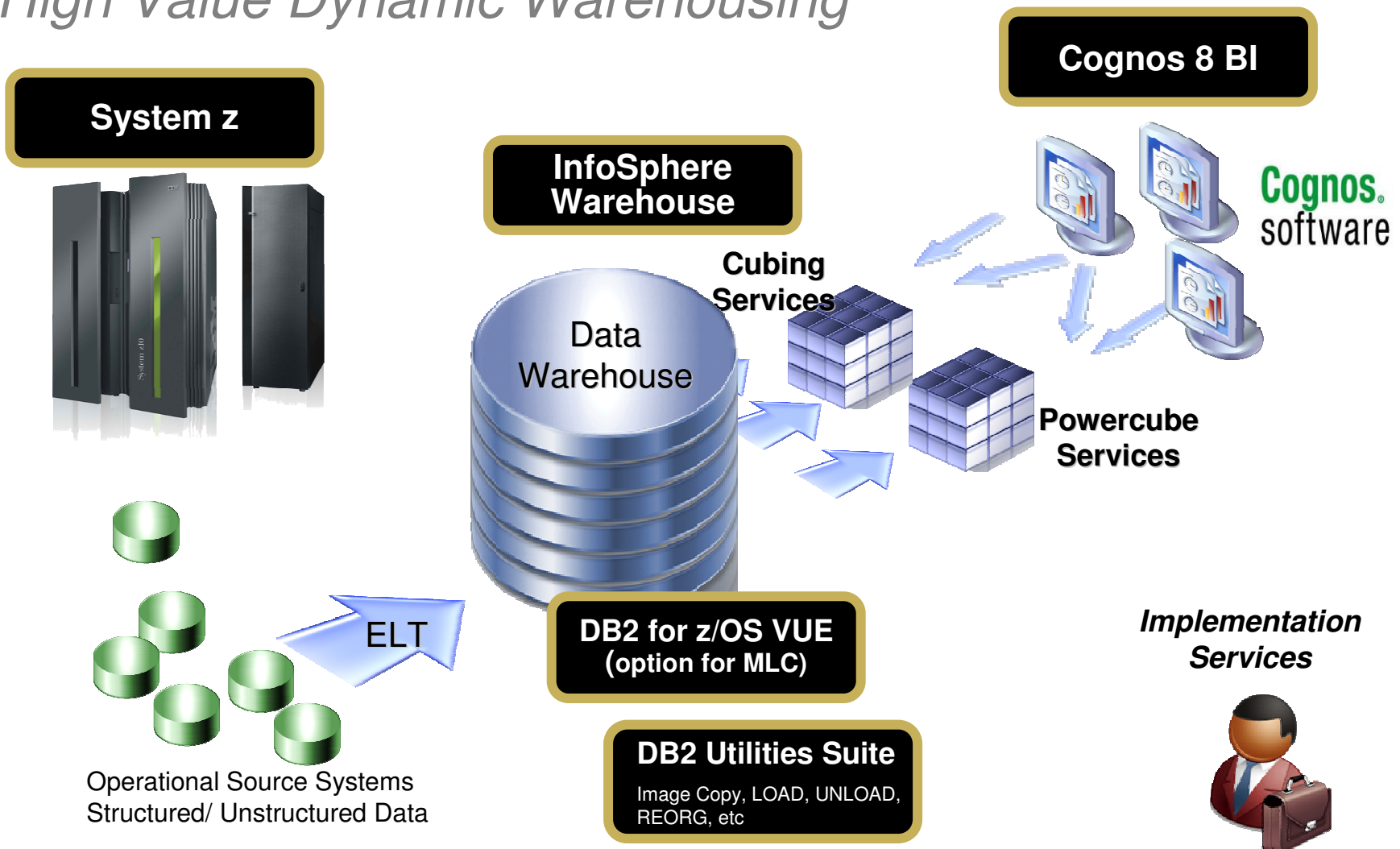
# ISAO Workload Analysis

## Overview IBM Smart Analytics Optimizer Customer Workload Analysis

Customer Workload	Query Elapsed Time			Query CPU Consumption on System z		
	DB2 only	DB2 with Smart Analytics Optimizer	Speed-up	DB2 only	DB2 with Smart Analytics Optimizer	Saving
Retail US	25 s – 5435 s	2s – 8s	4 - 1424	1 s – 32011s	0.04s – 2s	0% - ~100%
Banking Europe	600s – 10680s	1s – 4200s	1,2 - 378			
Distribution Consumer Products US	36000s for all queries	300s for all queries	120	72000s for all queries	1s for all queries	~100%
Distribution Chemical Products US	1200s for all queries	7s for all queries	170	1200s for all queries	1s for all queries	~100%
Retail Europe	8s – 131s	1s – 29s	4 – 115			
Banking Europe	7s – 119s	1s – 62s	2 - 48			

# IBM Smart Analytics System 9600

## High Value Dynamic Warehousing





### Typical Utilization for Servers

Windows: 5-10%    Unix: 10-20%    **System z: 85-100%**

System z can help **reduce** your floor space up to **75%-85%** in the data center



# Thank You



**System z** can lower your total cost of ownership, requiring **as little as 30%** of the power of a distributed server farm running equivalent workloads

The cost of storage is typically **three times more** in distributed environments

