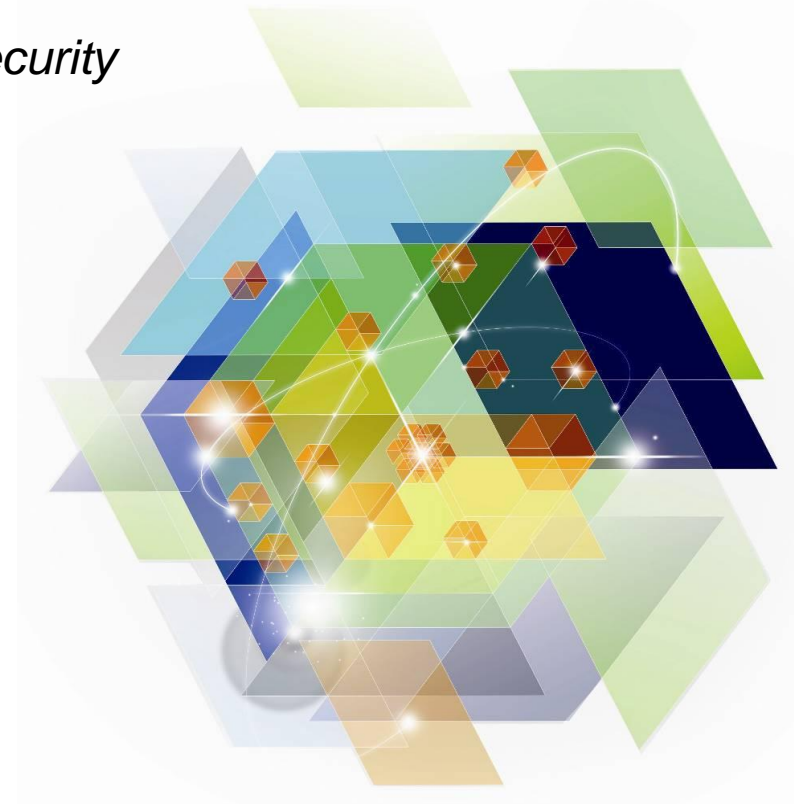




# Maximizing the Value of Your Data

*Delivering Information Governance and Data Security  
Turning Insight into Action with  
Intelligent Reporting and Predictive Analytics*

**Steve Mink**

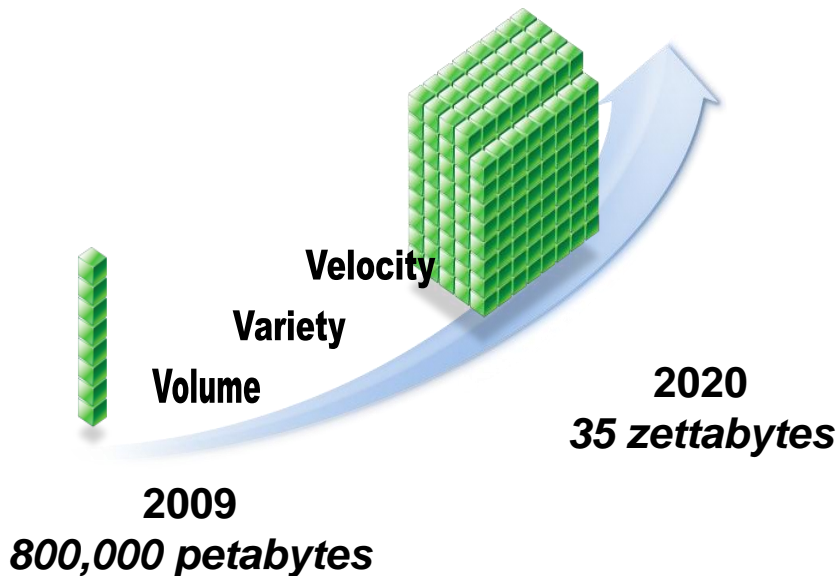


# Information is at the Center Of a New Wave of Opportunity...

## ... And Organizations Need Deeper Insights

# 44x

as much Data and Content  
Over Coming Decade



### 1 in 3

Business leaders frequently make decisions based on information they don't trust, or don't have

### 1 in 2

Business leaders say they don't have access to the information they need to do their jobs

### 83%

of CIOs cited "Business intelligence and analytics" as part of their visionary plans to enhance competitiveness

### 35%

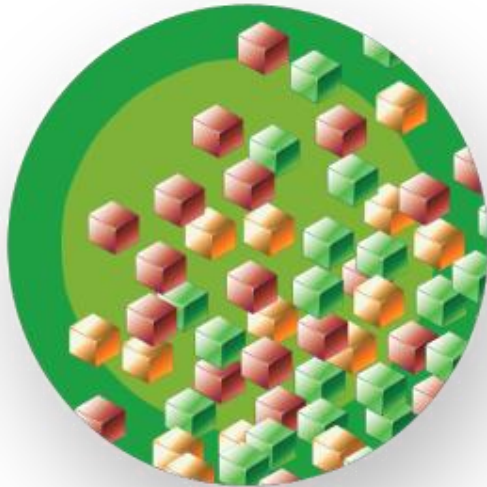
of businesses will look to replace their current warehouse with a pre-integrated Warehouse solution in the next 3 years; only 14% have today

Sources:

- The Guardian, May 2010
- IBM Institute for Business Value, 2009
- IBM CIO Study 2010
- TDWI: Next Generation Data Warehouse Platforms Q4 2009

# There is a Gap Between Information and Outcomes

## Information Explosion



*How do I align my information with my business?*

*How do I make the right information available when and where it's needed?*

*How do I support better decision making throughout my organization?*

## Optimized Outcomes



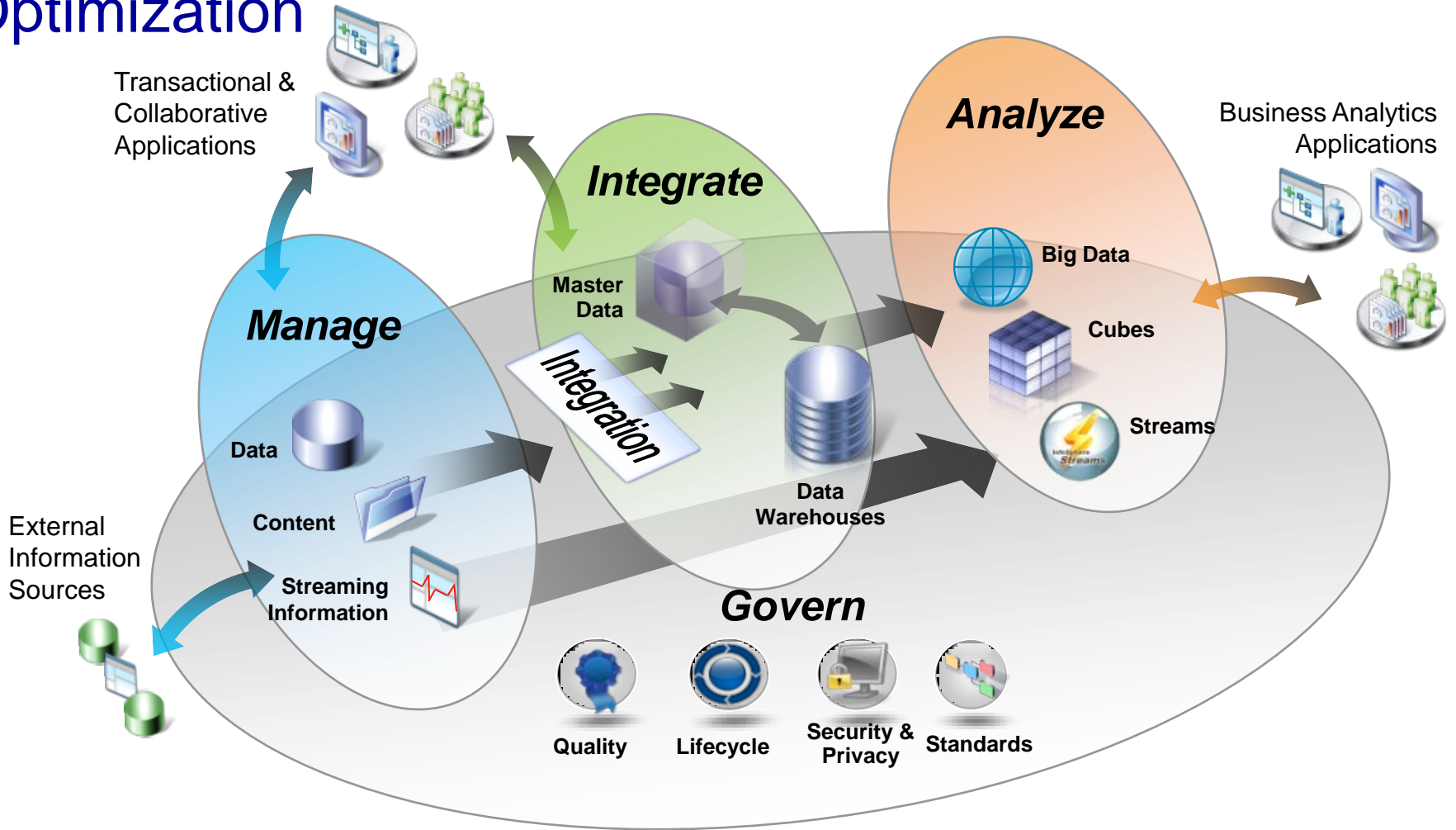
**Customer Insight**

**Supply Chain Management**

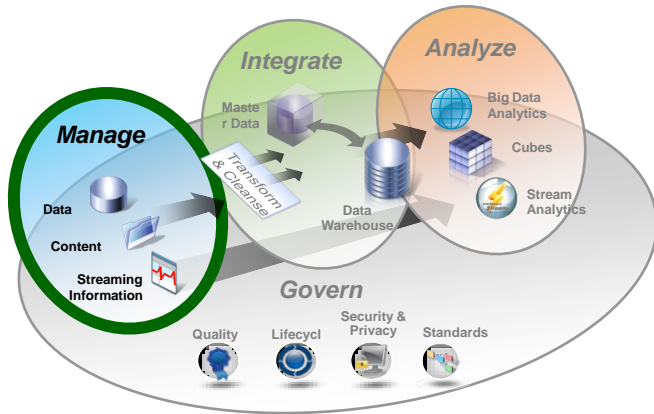
**Fraud Detection**

**Human Capital Management**

# Foundation for Business Analytics and Optimization



# Managing Information



## Data Management

- Capabilities for managing structured information
- Leverage existing IT investments across a heterogeneous landscape
- Flexibility to adapt to changing business needs
- Lower total cost of ownership

## Key Capabilities

**Clustering**

**Java Optimizations**

**Data compression**

**SQL skins**

**Autonomic**

**Workload Optimization**

**In memory DB**

**XML**

### Products

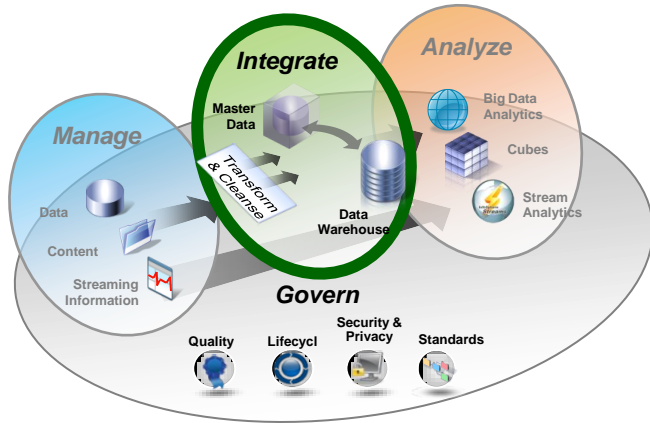
DB2

Solid DB

Informix

IMS

# Information Integration



## Data Warehouse

- Deal with TB and PB of data
- Reduced time to value, days not weeks
- Perform data mining without copying data
- Work with analytical and transactions data in real time.

## Key Capabilities

**Data mining & visualization**

**Embedded data movement and transformation**

**Unstructured Data Analysis**

**Extreme Workload Management**

**Data models & sample reports**

**Integrated analytics systems**

**Mashups**

**Real time analytics**

**Industry models**

**Clinical analytics**

**Modeling & design tools**

**Hadoop**

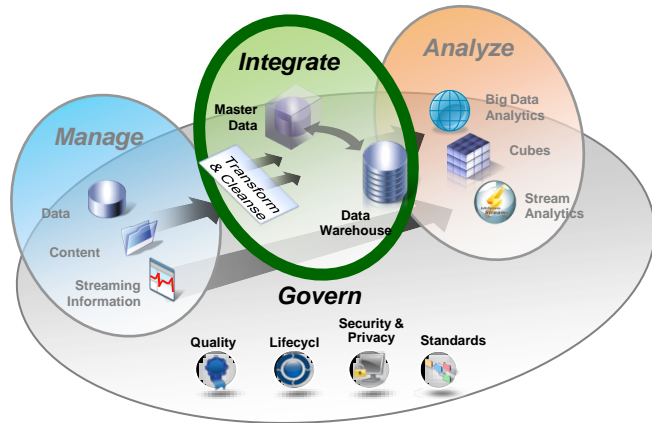
### Products

InfoSphere Data Warehouse



Data Warehouse Appliances  
2010

# Information Integration



## Information Integration

- Integrating and transform data and content to deliver authoritative, consistent, timely and complete information

## Key Capabilities

**Data Discovery**

**Data Profiling**

**Data Extraction,  
Transformation and  
Loading**

**Data Quality**

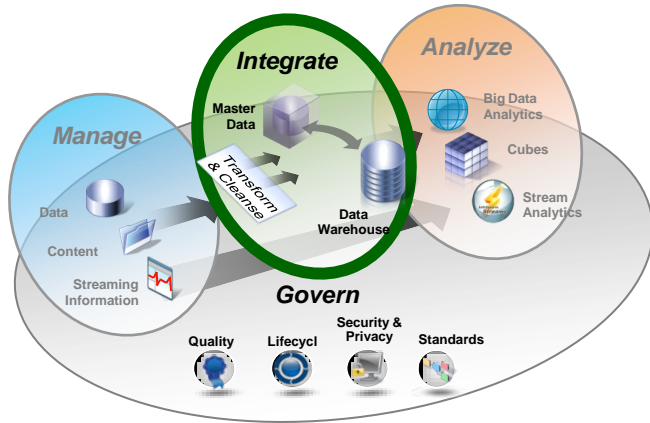
**Metadata  
Management**

**Data Modeling**

### Products

InfoSphere Information Server  
Change Data Capture  
Replication

# Information Integration



## Master Data Management

Create common data about customers, suppliers, partners, products, materials, accounts and other critical entities

### Key Capabilities

**Account**

**Customer**

**Product information**

**Asset track and trace**

**Entity Resolution & Analysis**

**Name Recognition**

**Healthcare Information Exchange**

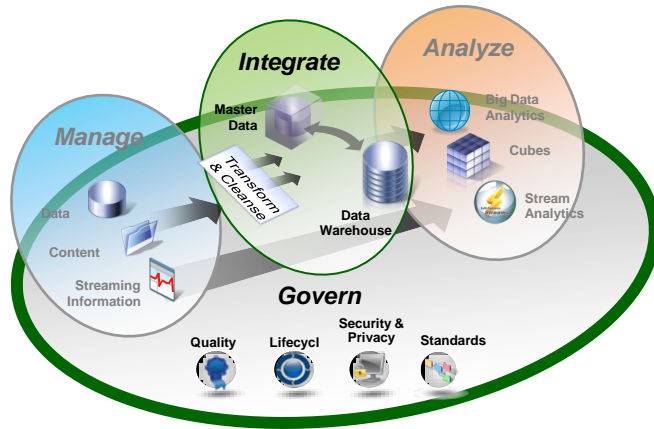
**Location**

#### Products

- InfoSphere MDM
- Initiate Exchange
- Entity Analytics



# Information Governance



## Information Governance, Risk, and Compliance

Delivers complete, consistent and accurate information that decision-makers trust to improve business performance

### Key Capabilities

**Data Discovery**

**Data Encryption**

**Data Growth  
Management**

**Data Masking**

**Database Activity  
Monitoring**

**Test Data  
Management**

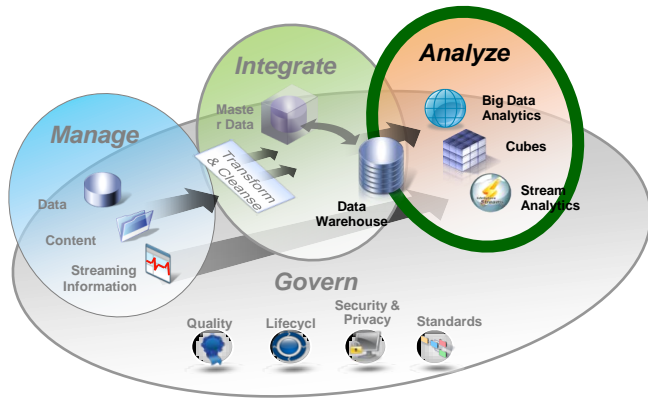
#### Products

Optim

Guardium

Infosphere Discovery

# Business Analytics



## Business Analytics

Delivers complete, consistent and accurate information that decision-makers trust to improve business performance

### Key Capabilities

**Business Intelligence**

**Predictive & Advanced analytics**

**Financial Performance & Strategy Management**

**Governance Risk & Compliance**

### Analytic Applications

Business intelligence & performance management  
2008

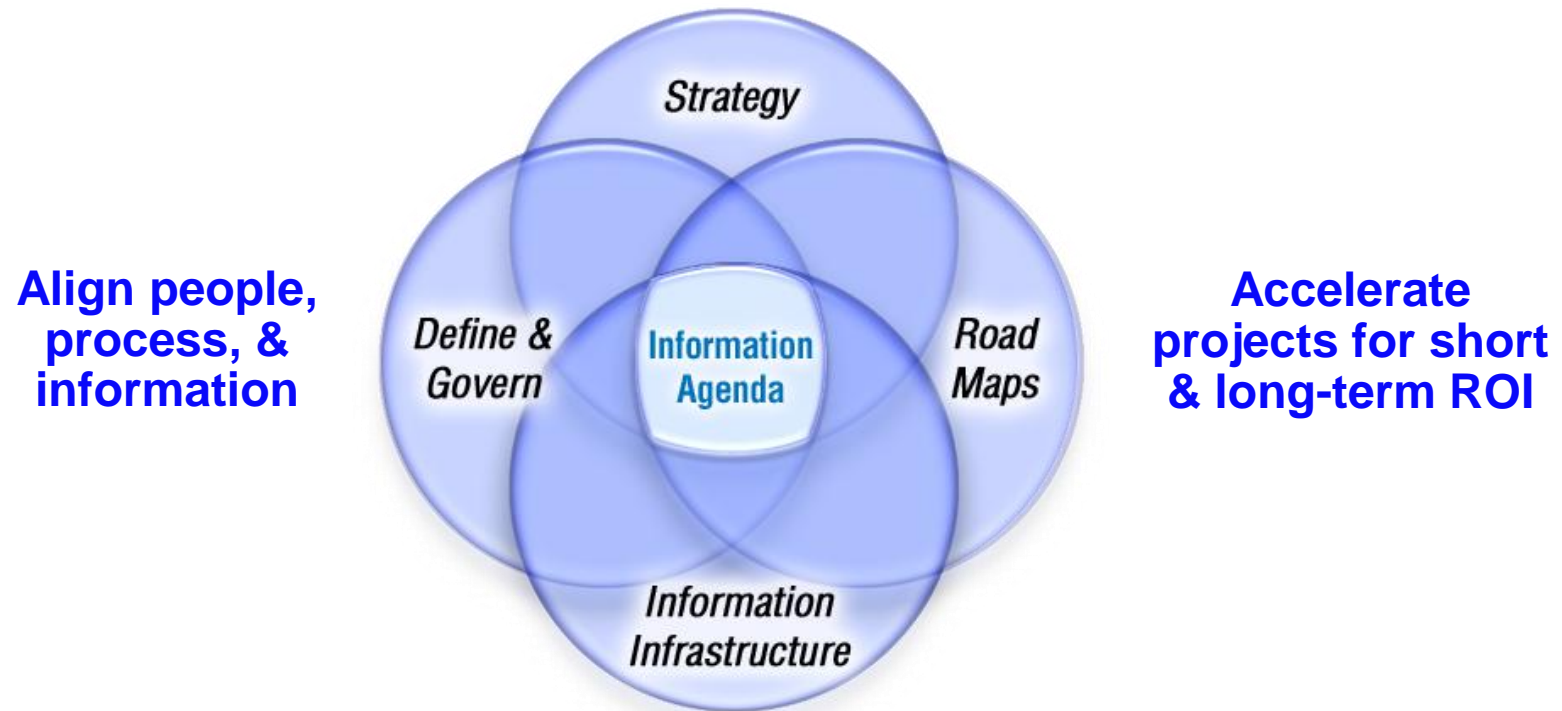
Predictive analytics  
2009

Governance, compliance, risk management  
2010

Financial governance  
2010

# The IBM Information Agenda Approach

**Establish end-to-end  
vision & business-driven  
value**



**Align people,  
process, &  
information**

**Accelerate  
projects for short  
& long-term ROI**

**Architect an extensible  
information infrastructure**

# Announcing IMS 12!

- Available October 28, 2011
- IMS 12 offers:

## 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



# IMS 12 Quality Partnership Program

- **IMS 12 was delivered to QPP customers in Dec 2010**
  - One customer in production over 100 days before GA  
Running 29 million transactions per day
  - Benchmarked at 65,000 transactions per second
- **Customer environment, application mix and workload exposure**
  - Customer production experience
  - GA readiness for production systems
- **Core group of participants from IMS 11 QPP**
  - Plus new participants
- **Large vendor program**
  - 26 vendors, 102 tools
- **Design council for IMS 12+ and future**



# 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 The most robust and cost effective data server

## DB2

- Deep synergy with System z
- HW Compression
- Consolidation

- Unmatched availability
- Unparalleled security
- Industry leading reliability

- Near-linear scalability
- Optimized for SOA
- Flexible development
- Warehousing capabilities

## DB2 9

- Up to 20% utility CPU savings
- Compress indexes, save 50% disk
- Native SQL procedures
- More CPU on specialty engines

- Flexible context and role security
- Expanded online schema changes
- Volume level backup & recovery

- Seamless integration of XML and relational
- Improved SQL
- Partition by growth
- OLAP expressions

## DB2 10

- Save up to 5-10% CPU batch & transactions out-of-the-box (rebind)
- On-the-fly data Compression
- Temporal data support
- Skip-level migration

- Ten times more concurrent users
- More online schema changes
- More granular access control

- Enhanced query parallelism
- More SQL compatibility
- Improved pureXML and SQL PL

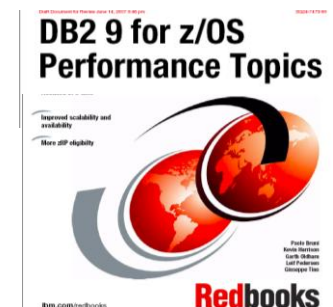


**V8 out of service April 2012**

# DB2 Deep Synergy With System z

## Key integration points include:

- Data sharing (availability and scale out)
- zIIP and other specialty engines
- Unicode conversion
- Encrypted communication & data
- Hardware data compression & encryption
- Cross-memory, memory protection keys
- Sorting
- Multi-core, large N-way
- 64-bit addressing and large memory
- z/OS Workload Manager
- z/OS Security Server (RACF)
- z/OS RRS integrated commit coordinator
- System z10 1 MB page size, decimal float
- Solid state disks
- zEnterprise z196/z114 and zBX





# DB2 10 for z/OS

**Generally Available - October 22, 2010**

**Completed Largest Beta Ever**

- 23 WW customers
- +10 Extended Beta
- Over 80 vendors

**Fastest uptake in 10 years**

- As of July, 2011 3x more unique customers compared to prior release
- More than 4x the number of licenses
- About 25% are migrating from V8
- Every core beta customer is continuing with migration plans

**First large customers already in production**

# What do you want from DB2?

- ✓ **Reduce CPU time 5% - 10%**
- ✓ **Increased ability to scale up**
- ✓ **Easier security compliance and audit**
- ✓ **Improved productivity**
  - ✓ **Temporal and more enhanced SQL & XML**
  - ✓ **Administration, scaling and performance**
  - ✓ **Move from DB2 9 or V8**
- ✓ **Ready for production, stable and available**
- ✓ **Customer references**

## DB2 10 has it!

Information Management

Draft Document for Review February 25, 2011 11:01 am

IBM  
SG24-7942-00

## DB2 10 for z/OS Performance Topics

Triton  
CONSULTING

DB2 10 for z/OS  
A Smarter Database for a Smarter Planet



# DB2 10 for z/OS: Cost Savings

## CPU reductions for transactions, queries, and batch

- CPU reductions of 5-10% for traditional workloads
- CPU reductions of up to 20% for new workloads
- Up to additional 10% CPU savings using new functions
- For static SQL, REBIND typically required

## 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



## Performance Enhancements requiring few changes (CM)

- **SQL runtime improved efficiency**
- **Address space, memory changes to 64 bit, some REBINDs**
- **Faster single row retrievals via open / fetch / close chaining**
- **Distributed thread reuse High Performance DBATs**
- **JCC Type2 and ODBC for z/OS performance improvements**
- **Parallel index I/O at insert**
- **Workfile in-memory enhancements**
- **Index list prefetch**
- **Solid State Disk tracking in Real Time Statistics**
- **Buffer pool enhancements**
  - Utilize 1MB page frames on z10 or z196/z114 – requires PGFIX(YES)
  - “Fully in memory” option (ALTER BUFFERPOOL)

# Performance Enhancements requiring REBIND (CM)

- **Most access path enhancements**
- **Further SQL runtime improvements**
- **Use of RELEASE(DEALLOCATE)**
- **SQL paging performance enhancements**
  - Single index access for complex OR predicates:
- **IN list performance**
  - Optimized Stage1 processing (single or multiple IN lists)
  - Matching index scan on multiple IN lists
- **Safe query optimization**
- **Query parallelism improvements**
- **More stage 2 predicates can be pushed down to stage 1**
- **More aggressive merge of views and table expressions**
  - Avoid materialization of views
- **If migrating from V8, get new RUNSTATS before mass rebind**

# Virtual Storage Relief enables performance options

- **After REBIND in v10, most thread storage moves above the bar (CM or NFM)**
- **Now you can consider using the RELEASE(DEALLOCATE) BIND option in more cases**
  - IBM measurements show up to 10-20% cpu savings
  - Effective for high volume transactions with thread reuse
  - DBM1 vstor was an inhibitor to using this option in the past
- **New feature called High Performance DBATs for DDF threads**
  - Prior to v10, DDF enforced RELEASE(COMMIT) for all DDF threads
    - This was done because of DBM1 vstor concerns, which are now gone in v10
  - With v10, this enforcement is removed, and RELEASE(DEALLOCATE) will now be honored
    - KEEP DYNAMIC=YES will not get benefit from this enhancement
- **With v10 vstor relief, MAXKEEPD can be increased which could improve dynamic SQL performance**
- **Tradeoff some increase in memory usage for reduced cpu**

## Performance Enhancements requiring NFM

- **DB2 catalog concurrency and productivity**
- **Compress on insert**
- **Most utility enhancements**
- **LOB streaming between DDF and rest of DB2**
- **SQL Procedure Language performance improvements**
- **Workfile spanned records, partition by growth**
- **Access to currently committed data**
- **Insert improvement for universal table spaces**
- **LRSN spin avoidance for inserts to the same page**
- **Efficient caching of dynamic SQL statements with literals**

# Performance Enhancements requiring NFM + DBA work

- **Hash access path**
- **Index include columns**
- **Inline LOBs**
  - Index on expression now possible for LOB columns
  - Important for spatial performance
  - LOAD/UNLOAD performance improvements
  - LOB compression for inline portion
- **DEFINE NO for LOB and XML columns**
- **MEMBER CLUSTER for universal table space**
- **Alter to universal table space, page size, data set size, segment size**
- **Online reorg for all catalog and directory table spaces**



# DB2 Analytics Accelerator V2 – Available Nov 25, 2011

*Capitalizing on the best of both worlds – System z and Netezza*

## What is it?

*The IBM DB2 Analytics Accelerator is a workload optimized, appliance add-on, that enables the integration of business insights into operational processes to drive winning strategies. It accelerates select queries, with unprecedented response times.*



## How is it different?

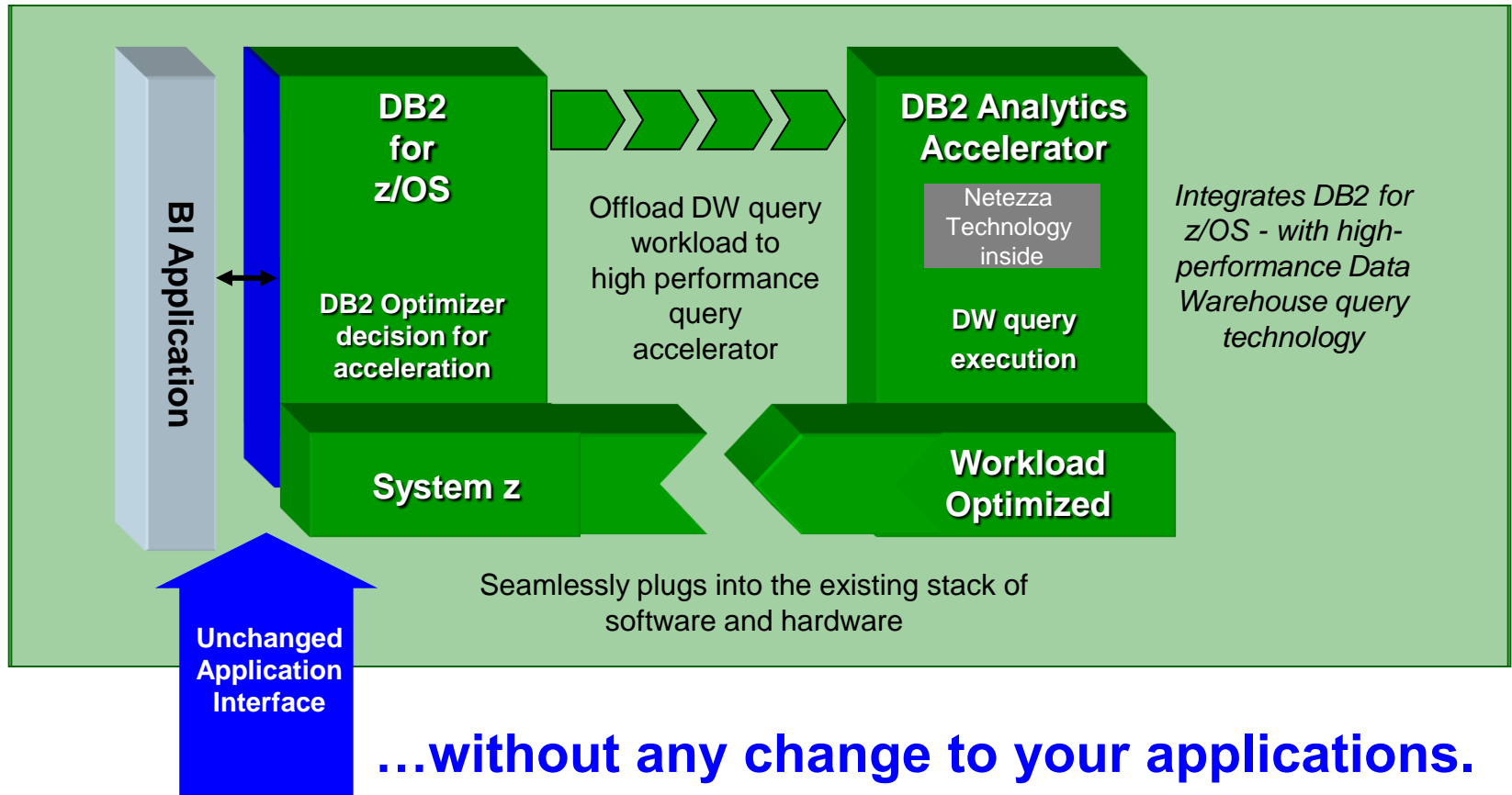
- **Performance: Unprecedented response times to enable 'train of thought' analyses frequently blocked by poor query performance.**
- **Integration: Connects to DB2 through deep integration providing transparency to all applications.**
- **Self-managed workloads: queries are executed in the most efficient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

***Breakthrough Technology Enabling New Opportunities***

# Optimizing to the Workload

*Marrying the best of each environment*

**Total solution remains centrally managed by System z...**

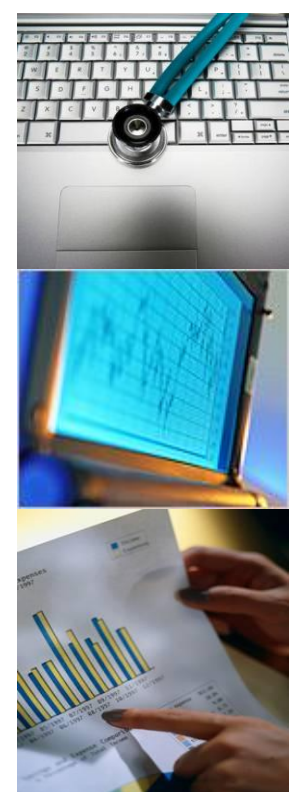
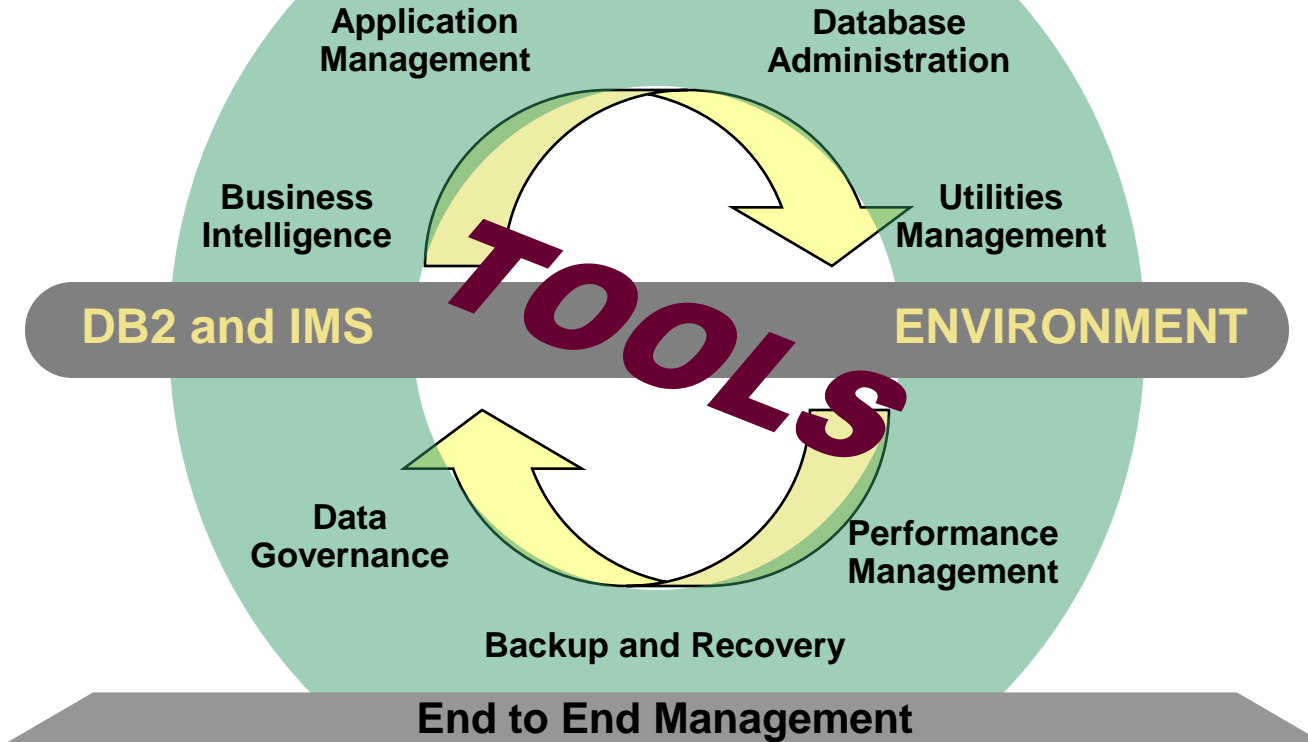


## Key Enhancements available in IDAA V2

- Extending acceleration to significantly larger number of queries
- Expanded size of the data to be accelerated
- Improved concurrent query execution
- Incremental update by partition
- DB2 9 and DB2 10 for z/OS support
- Supported only connected to zEnterprise (z196/z114)

# Managing Your Business Environment

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



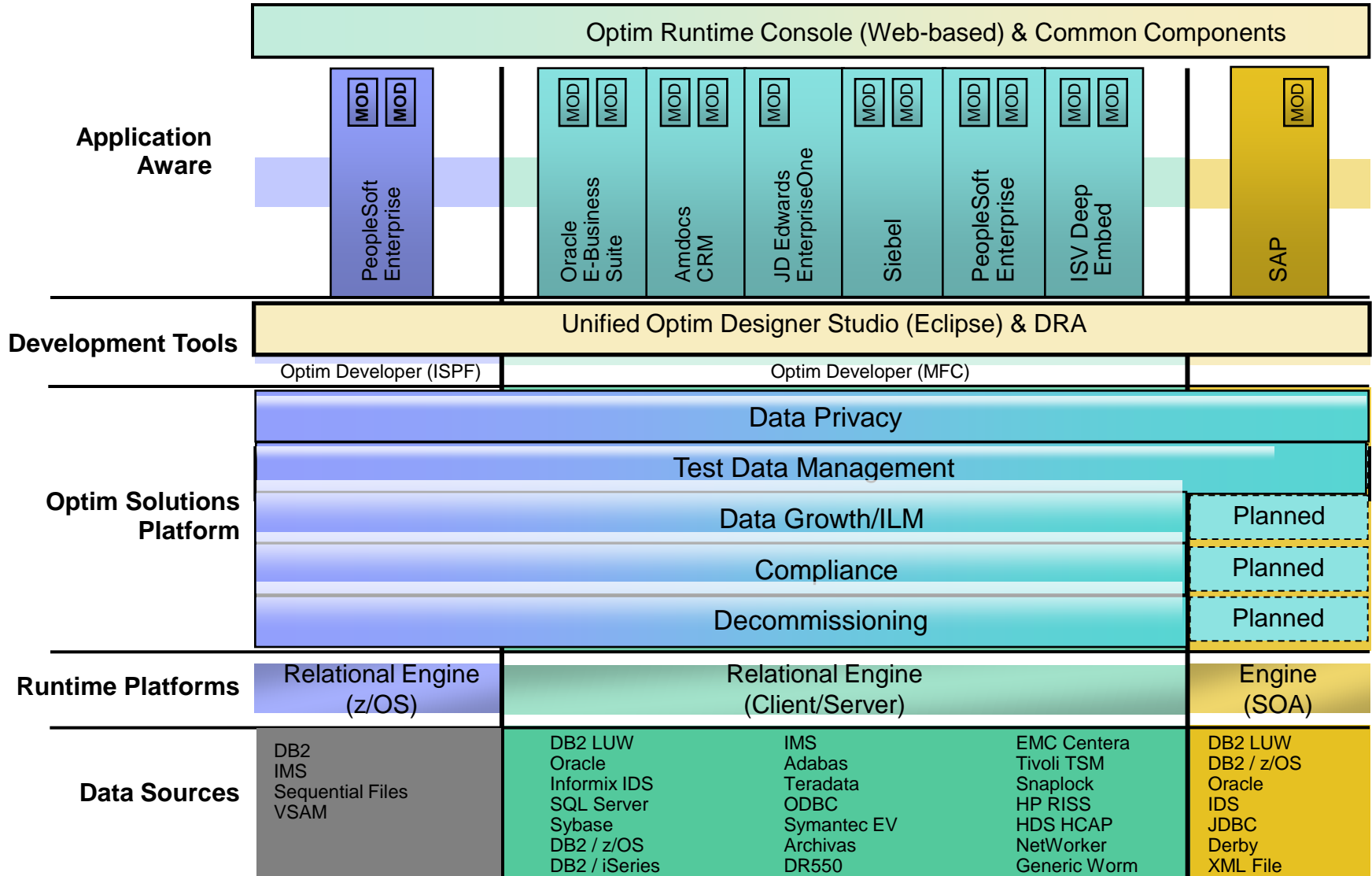
## ***Business Challenges***

- 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

**ROI**

**Resiliency**

# Optimize Data Growth, Testing, and Retirement

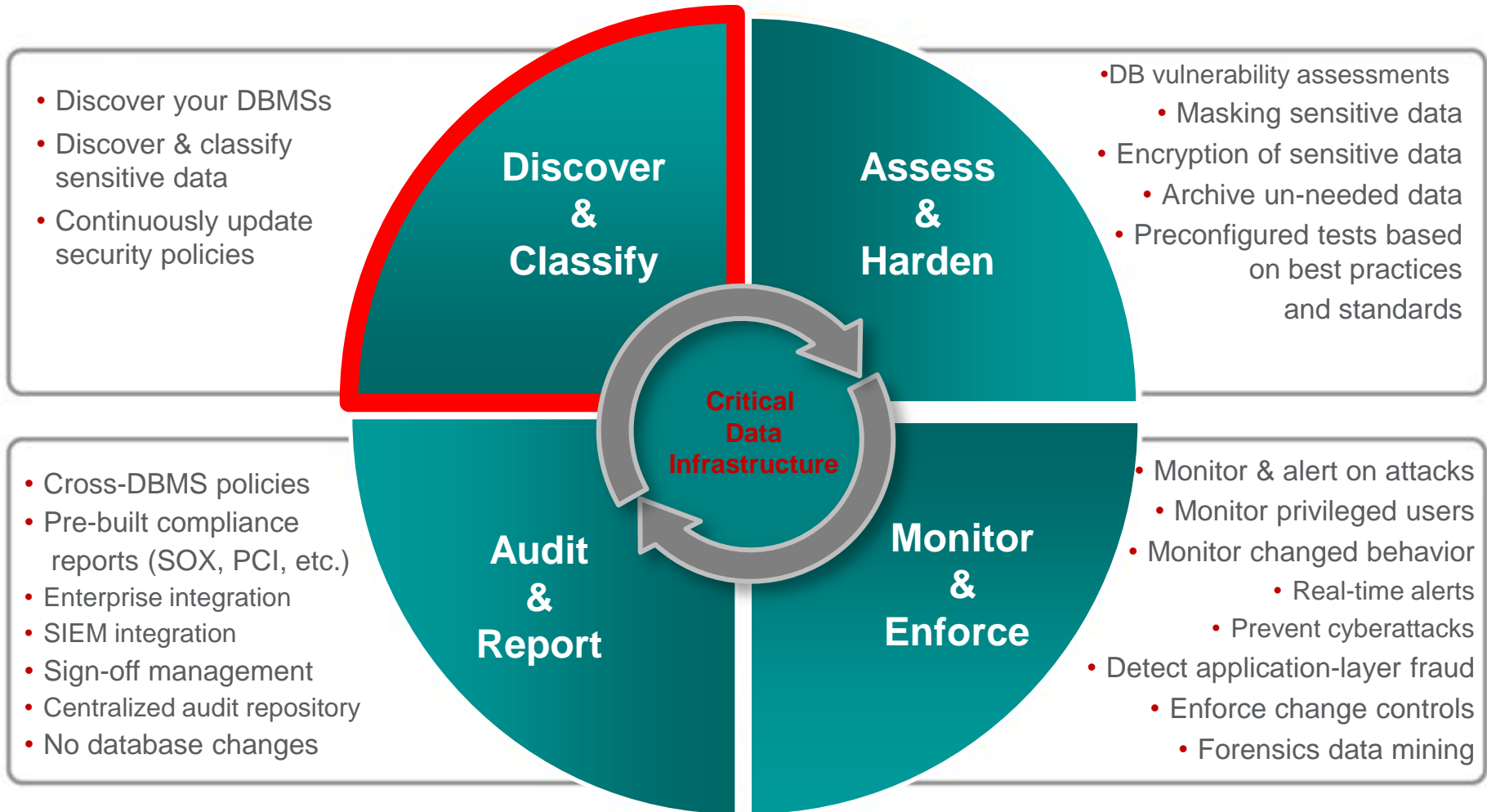


# Growing Compliance Mandates



- **Explosion in successful breaches has resulted in growing regulation of sensitive data in North America**
  - SOX
  - HIPAA
  - PCI DSS
  - 46 state-specific data privacy laws
  - Gramm-Leach-Bliley
- **Many EU and Asian countries have enacted similar regulations**
  - EU Data Privacy Directive and supporting local laws
  - C-SOX
  - FIEL
  - PCI DSS
  - etc.

# Address the Full Data Protection Lifecycle



# Sensitive Data Discovery - Infosphere Discovery

- **Common PII data element discovery**
  - Pre-Defined Scanning
- **Custom sensitive data discovery**
  - Supply Discovery with “descriptions/examples”
    - *Patterns*
    - *Data examples.*
  - Discovery will scan for matching columns
- **Hidden sensitive data discovery**
  - Sensitive data embedded in free text columns
    - Scan by “floating” patterns
  - Sensitive data that is partial or hidden
    - Use Transformation Discovery to find data that are “transformed”



# Why is Sensitive Data Discovery so Data Difficult?

## Sensitive Relationship Discovery

System A Table 1		System A Table 15		
Number	Name	Patient	Result	Test
3544600986	AlexFulltheim	3802468	N	53
5728150928	BarneySolo	4182715	N	53
3786736304	BillAlexander	4600986	N	32
6783802468	BobSmith	5061085	N	53
4035567193	EileenKratchman	5567193	N	72
8037409934	FredSimpson	6123913	Y	47
4306123913	George Brett	6736304	N	34
9525061085	JamieSlattery	7409934	N	34
4594182715	JimJohnson	8150928	N	47
1288966020	MartinAston	8966020	N	34

System Z Table 25	
Test	Name
53	Streptococcus pyogenes
72	Pregnancy
32	Alzheimer Disease
47	Hemorrhoids
34	Dermatamycoses

- **Sensitive data can't be found just by a simple data scan.**
  - Must connect tables and lookup tables
  - Hidden within larger fields (substring)
  - Hidden across fields (concatenations)
  - Represented differently (lookup tables and case statements)
  
- **“Corporate memory” is poor**
  - Documentation is incomplete
  - SME's and Data Analysts are only knowledgeable of one or two systems

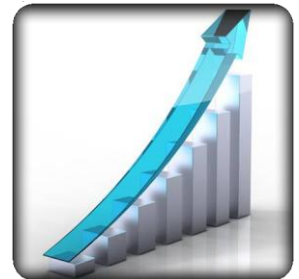
# Address the Full Data Protection Lifecycle



# Assess and Harden - Guardium Vulnerability Assessment

*Based on best practices*

- **New capability enabling to cost effectively improve the security of mainframe environments by conducting automated database vulnerability assessment tests**
  - Packaged tests to detect vulnerabilities including inappropriate privileges, grants, default accounts, etc..
  - Capabilities enabling the development of custom tests
- **Based on industry standards such as STIG and CIS**
- **Management of mainframe VA testing from central InfoSphere Guardium console for enterprise-wide control**
  - Configuration and scheduling of mainframe tests
- **Integrated with other InfoSphere Guardium elements for improved process efficiency, including Compliance Workflow Automation and audit repository**



# System z Vulnerability Assessment

IBM® InfoSphere™ Guardium®

Results for Security Assessment: **VA test for system Z**  
 Assessment executed **2010-09-20 13:55:27.0**  
 From: **2010-09-19 13:55:27.0**  
 To: **2010-09-20 13:55:27.0**  
 Client IP or IP subnet: **Any**  
 Server IP or IP subnet: **Any**

Tests passing: **88%**  
count any current filtering

Based on the tests performed under this assessment, data access of the defined database environments conform to best practices. You have a controlled environment in terms of the tests performed. You should consider scheduling this assessment as an audit task to continuously assess these environments.



Result Summary Showing 73 of 73 results (0 filtered)

	Critical	Major	Minor	Caution	Info
Privilege	46p 4f	7p 1f	-	-	-
Authentication	-	-	-	-	-
Configuration	1p	-	-	-	-
Version	-	1p	-	-	-
Other	1p	3p 2f	2p 1f	-	3p 1f

**Current filtering applied:**  
 Test Severities: - Show All -  
 Datasource Severities: - Show All -  
 Scores: - Show All -  
 Types: - Show All -

Assessment Test Results

Showing 73 of 73 results (0 filtered)

Test / Datasource	Result
<b>z/OS Grant option - Resauth</b> Test category: <b>Priv.</b> Severity: <b>Critical</b> This test check for privileges on various resources that has been granted with the grant option. These resource include: Buffer pool, Collection, Distinct type, Table space, Storage group and JAR file. Grant option is not a good practice and should be avoid where possible. When privileges are granted with the grant option, a user can grant privileges on that resource to other users. We do not recommend granting resource privilege with grant option. This test exclude grantee who is a member of SYSADM and SYSIBM user. Ext. Reference: Guardium, Test ID 2179	<b>Fail</b> One or more resources privileges has been granted with the grant option. <b>Recommendation:</b> We recommend that you revoke resources privileges granted with the grant option. Please redo your resource privilege so that you are using grant instead of grant option. If you need to exclude certain grantee or resource that must have grant option, you can create a group then populate it with authorize grantee and or resource name and link your group to this test.
<b>System Z Datasource</b> Datasource type: <b>DB2</b> Severity: <b>None</b> Details: Grantee causing failure: Grantee=ADMIN_A: Obtype=D: Qualifier=GU0003: Name=CANADIAN_DOLLAR Grantee=ADMIN_A: Obtype=D: Qualifier=GU0002: Name=CANADIAN_DOLLAR	
<b>z/OS Grant option - Schema</b> Test category: <b>Priv.</b> Severity: <b>Critical</b> This test check for schema privileges that has been granted with the grant option. Grant option is not a good practice and should be avoid where possible. When object privileges are granted with the grant option, a user can grant privileges on that object to other users. We do not recommend granting objects privilege with grant option. This test exclude grantee who is a member of SYSADM and SYSIBM user. Ext. Reference: Guardium, Test ID 2181	<b>Fail</b> One or more object privileges has been granted with the grant option. <b>Recommendation:</b> We recommend that you revoke schema privileges granted with the grant option. Please redo your schema privilege so that you are using grant instead of grant option. If you need to exclude certain grantee or objects that must have grant option, you can create a group then populate it with authorize grantee and or objects name and link your group to this test.

# System z Vulnerability Assessment - Remediation

IBM InfoSphere Guardium: Security Assessment Results - Mozilla Firefox

9.70.147.47 https://9.70.147.47:8443/saResultsViewer.do?method=view&viewerType=testResultDetails&viewedTaskId=-1&selectedTestResultId=20158&saResultId=20001

## IBM InfoSphere™ Guardium®

Results for Security Assessment: **VA test for system Z**

Assessment executed **2010-09-20 13:55:27.0**  
 From: **2010-09-19 13:55:27.0**  
 To: **2010-09-20 13:55:27.0**

Client IP or IP subnet: **Any**  
 Server IP or IP subnet: **Any**

### Test Result History

Time	Result
12:00 PM	PASS
6:00 PM	PASS
9/20/10	FAIL
6:00 AM	FAIL
12:00 PM	FAIL
6:00 PM	FAIL

### z/OS Grant option - Resauth

Test category: **Priv.** Test severity: **Critical**

### System Z Datasource

Datasource type: **DB2** Datasource severity: **None**

### Fail

One or more resources privileges has been granted with the grant option.

Short Description: This test check for privileges on various resources that has been granted with the grant option. These resource include: Buffer pool, Collection, Distinct type, Table space, Storage group and JAR file. Grant option is not a good practice and should be avoid where possible. When privileges are granted with the grant option, a user can grant privileges on that resource to other users. We do not recommend granting resource privilege with grant option. This test exclude grantee who is a member of SYSADM and SYSIBM user.

External Reference: Guardium, Test ID 2179

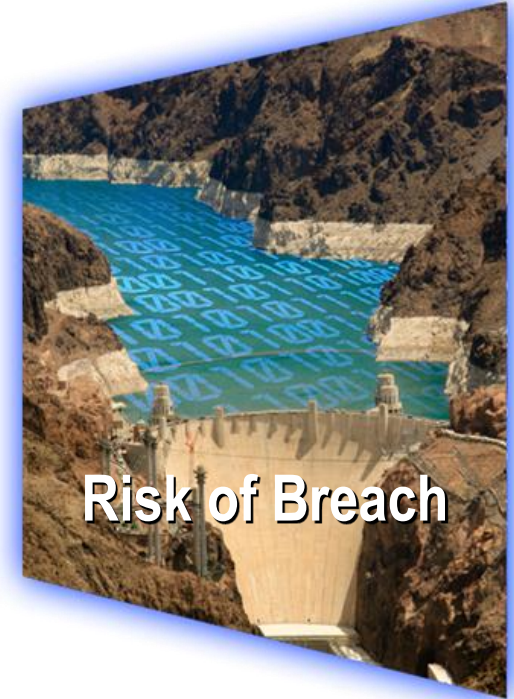
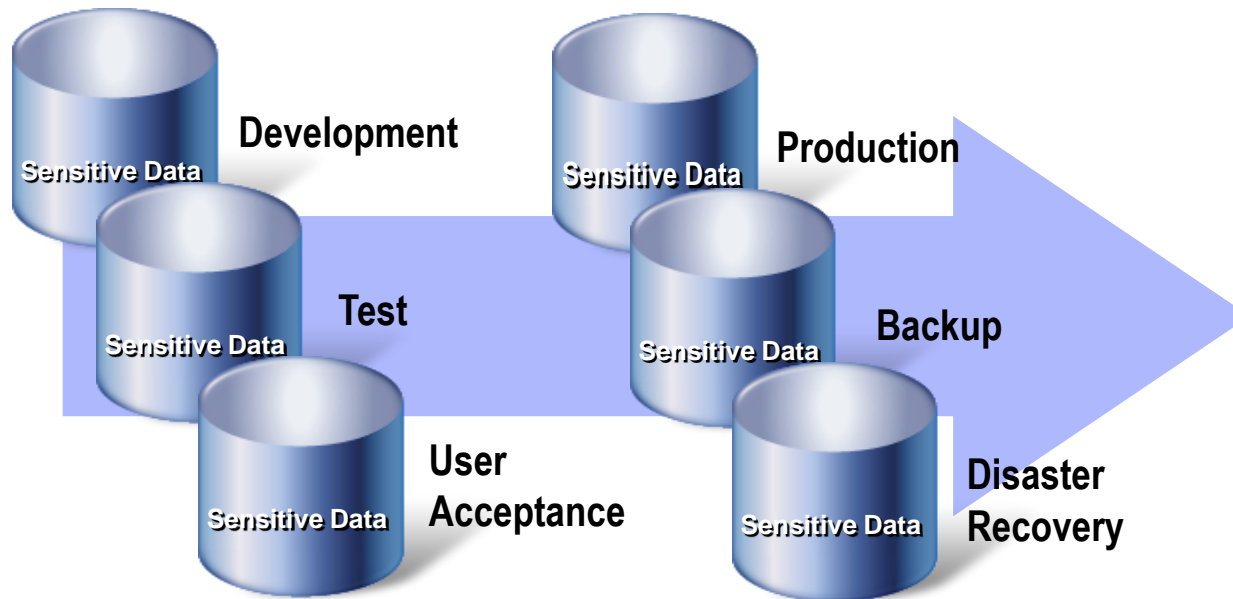
**Recommendation:** *We recommend that you revoke resources privileges granted with the grant option. Please redo your resource privilege so that you are using grant instead of grant option. If you need to exclude certain grantee or resource that must have grant option, you can create a group then populate it with authorize grantee and or resource name and link your group to this test.*

Details: Grantee causing failure: Grantee=ADMIN\_A: Obtype=D: Qualifier=GU0003: Name=CANADIAN\_DOLLAR  
 Grantee=ADMIN\_A: Obtype=D: Qualifier=GU0002: Name=CANADIAN\_DOLLAR

[Close this window](#)

Done

# Assess and Harden Sensitive Data Proliferation



**Actual risk and compliance burden =  
Original production data + all derived clones**

# Assess and Harden - Data Masking

Masked or transformed data must be appropriate to the context:

- Consistent formatting (alpha to alpha)
- Context and application aware
- Within permissible range of values
- Maintain referential integrity

A comprehensive set of data masking techniques to transform or de-identify data, including:

- String literal values
- Character substrings
- Random or sequential numbers
- Arithmetic expressions
- Concatenated expressions
- Date aging
- Lookup values
- TRANS COL

## Example 1

Patient Information			
Patient No.	123456	SSN	333-22-4444
Name	Erica Schafer		
Address	12 Murray Court		
City	Austin	State	TX Zip 78704

Data is masked with contextually correct data to preserve integrity of test data

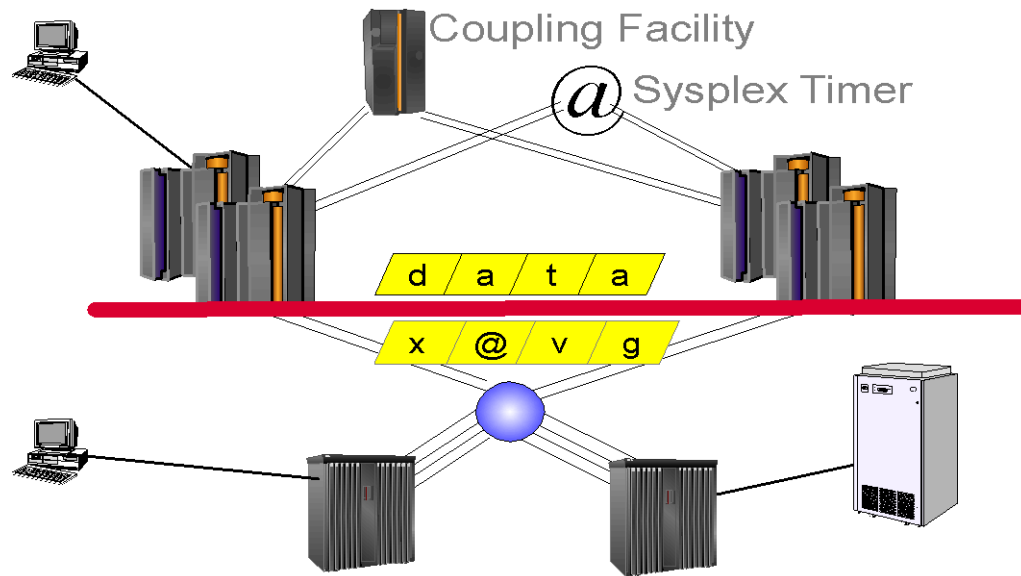
## Example 2

Personal Info Table		
PersNbr	FirstName	LastName
10000	Jeanne	Renoir
10001	Claude	Monet
<b>10002</b>	<b>Pablo</b>	<b>Picasso</b>
	⋮	

Referential integrity is maintained with key propagation

Event Table		
PersNbr	FstNEvtOwn	LstNEvtOwn
<b>10002</b>	<b>Pablo</b>	<b>Picasso</b>
<b>10002</b>	<b>Pablo</b>	<b>Picasso</b>

# Assess and Harden - Data Encryption for IMS and DB2



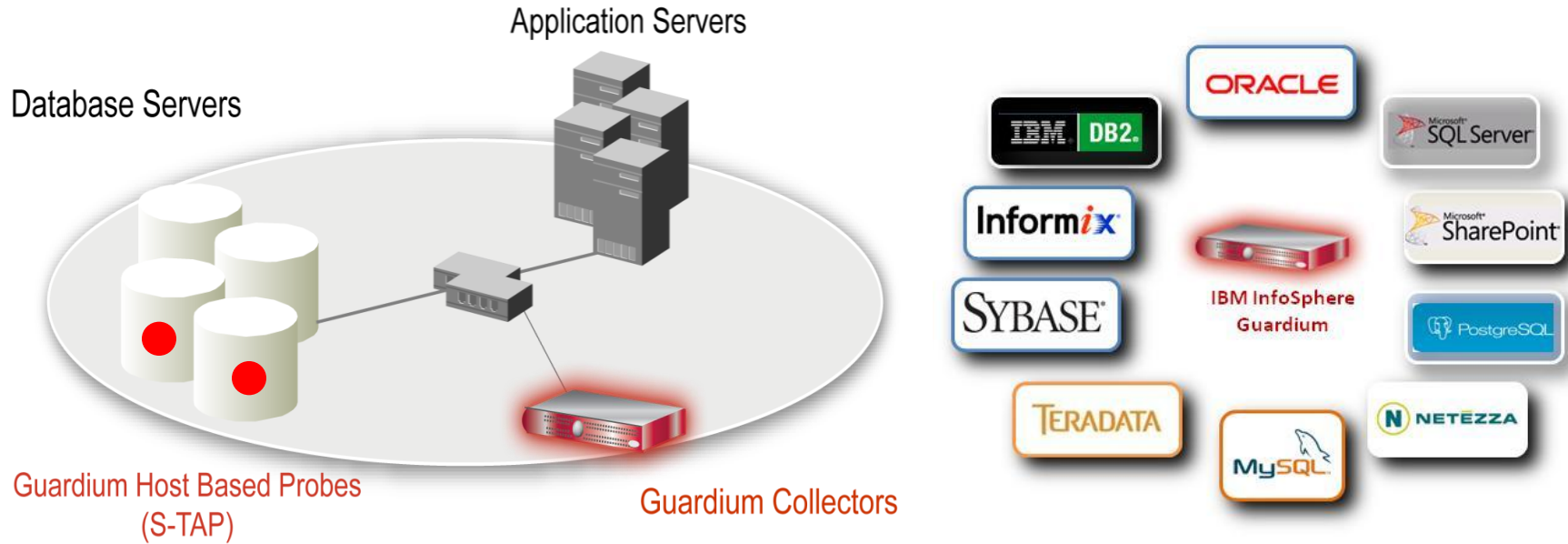
- **Row/Segment level encryption**
- **Data encrypted on disk and through channel**
- **Pre-coded EDITPROC for DB2 and segment edit routines for IMS**
  - Can be used for multiple tables / segments
  - Fast Implementation
- **Low Performance overhead**
- **Key management – use System/z facilities**
  - No new key management facility learning curve
  - Uses existing ICSF facility to manage encryption keys in one central repository
- **Supports all levels of DB2**
- **No application changes**
  - System administration changes only to the segment or table definition
- **Compatible with DB2 Load/Unload utilities and DB2 Tools**
- **Encryption and compression can be combined**
- **Supports both secure key and clear key encryption**



# Address the Full Data Protection Lifecycle

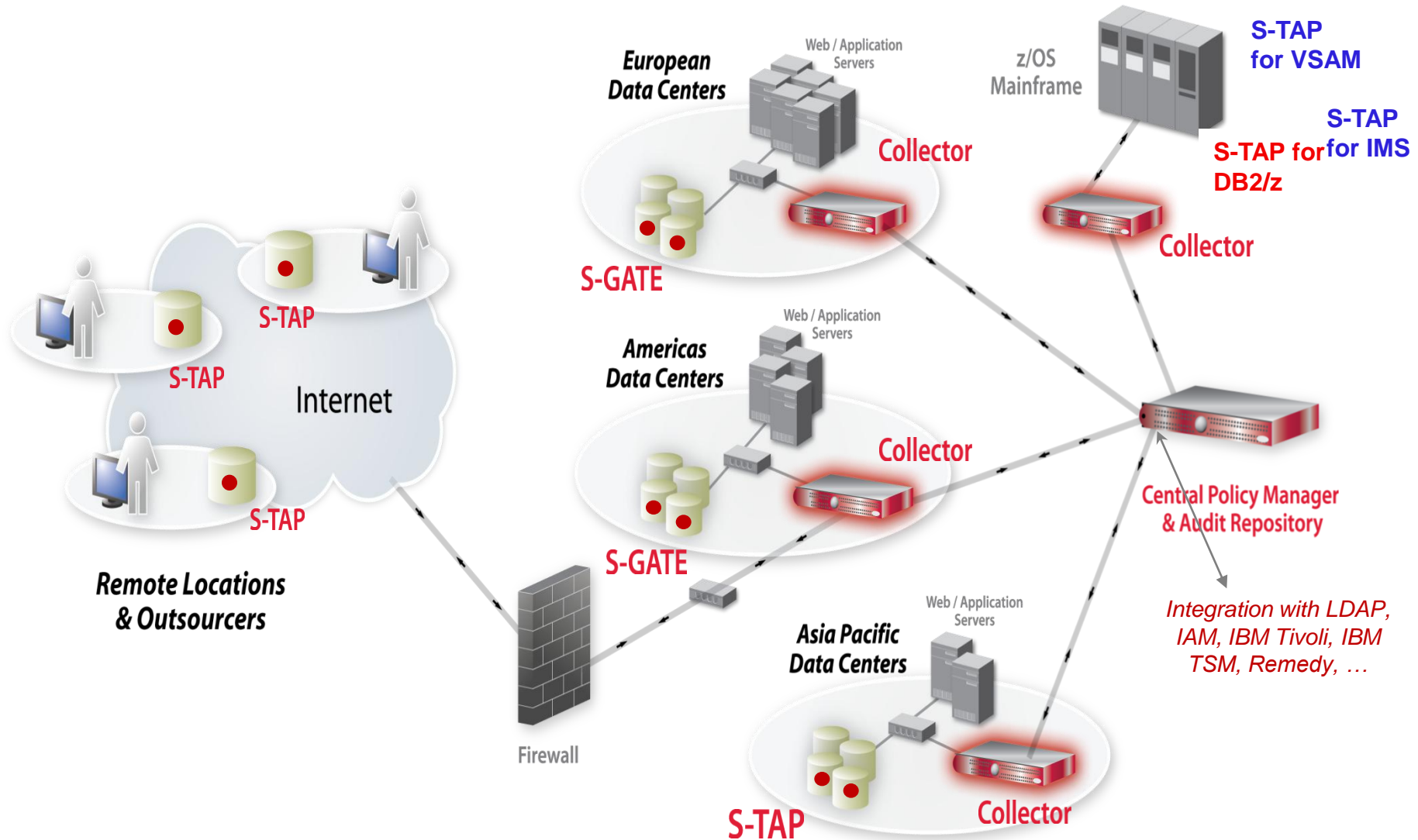


# Monitor and Enforce – Database Activity Monitoring

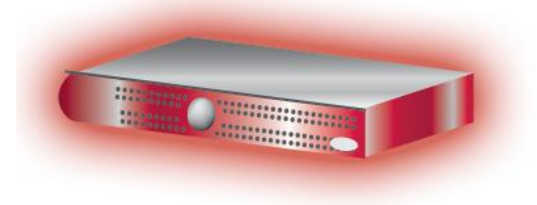


- Non-invasive architecture
  - Outside database
  - Minimal performance impact
  - No DBMS or application changes
- Cross-DBMS solution
- 100% visibility including local DBA access
- Enforces separation of duties
- Does not rely on DBMS-resident logs that can easily be erased by attackers, rogue insiders
- Granular, real-time policies & auditing
  - *Who, what, when, how*
- Automated compliance reporting, sign-offs & escalations (SOX, PCI, NIST, etc.)

# Scalable Multi-Tier Architecture

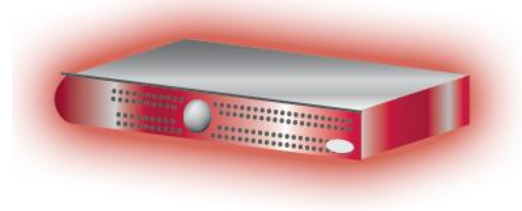


# Guardium for System z



- **Provides a unified view and secure audit trail of all database activities**
  - Across *both* mainframe and distributed environments
  - Enterprise-wide compliance reporting, alerting, analytics & forensics
- **Best Database Activity Monitor Technology from Guardium**
  - Leverage all Guardium functionality off host
- **Best DB2 for z/OS event capture technology**
  - Lightweight deployment
    - Audited data streamed to Guardium appliance, not stored in DB2/z
  - DB2 trace not used for high volume SQL events
    - Class 4 / Class 5 audit traces NOT used
  - Ongoing performance and collection enhancements
  - Optimal performance for customers using IBM DB2 Query Monitor for z/OS
    - **Query Monitoring and Audit requirements leverage a single collector process**

# Guardium for System z - Components




- **Guardium Collector appliance for System z**
  - Securely stores audit data collected by mainframe tap
  - Provides analytics, reporting & compliance workflow automation
  - Integrated with Guardium enterprise architecture
    - Centralized, cross-platform audit repository for enterprise-wide analytics and compliance reporting across mainframe & distributed environments
  
- **S-TAP for DB2 on z/OS event capture**
  - Mainframe tap
  - Collects audit data for Guardium appliance
  - Leverages existing IBM DB2/z collection technology
  - DB2/z event capture policy editor
  
- **S-TAP for IMS and for VSAM**
  - Available September 11, 2011


# Address the Full Data Protection Lifecycle



# Audit and Report

- Custom reporting
- Pre-Built SOX and PCI accelerators
  - Financial application monitoring (EBS, JD Edwards, Peoplesoft, etc)
  - Authorized application access only
  - Automated compliance reporting, sign-offs & escalations (SOX, PCI, NIST, etc.)

PCI Accelerator 

Overview | REG 3 Protect  | REG 6 Maintain | REG 7 Restrict | REG 8 Assign | PCI Req. 10 Track & Monitor | REG 11 Test | PCI Policy Monitoring

Overview  
 Cardholder Server IPs List  
 Cardholders DBs  
 Cardholder Objects  
 Data Access Map  
 DB Clients to Servers Map  
 Active DB Users  
 Cardholder DB Administration  
 Source Programs  
 Review Groups

PCI - Cardholder Server IPs

Start Date: 2007-01-01 00:00:00 End Date: 2007-05-31 00:00:00

<u>Server IP</u>	<u>Server Type</u>	<u>Database Name</u>	<u>Count of Sessions</u>
192.168.1.186	ORACLE	CARD_DATA	8
192.168.2.51	ORACLE	CARD_DATA	140
192.168.200.108	DB2	CARD_DATA	182
192.168.200.108	DB2	DN8DEMO3	258
192.168.200.108	DB2	SAMPLE	44

# Business Analytics on zEnterprise

*Turn Insight into Action  
with Intelligent Reporting  
and Predictive Analytics*





**Generate  
More Revenue**

**Reduce Risk**

**Predict Future Outcomes  
with Greater Confidence**

**Lower Costs**

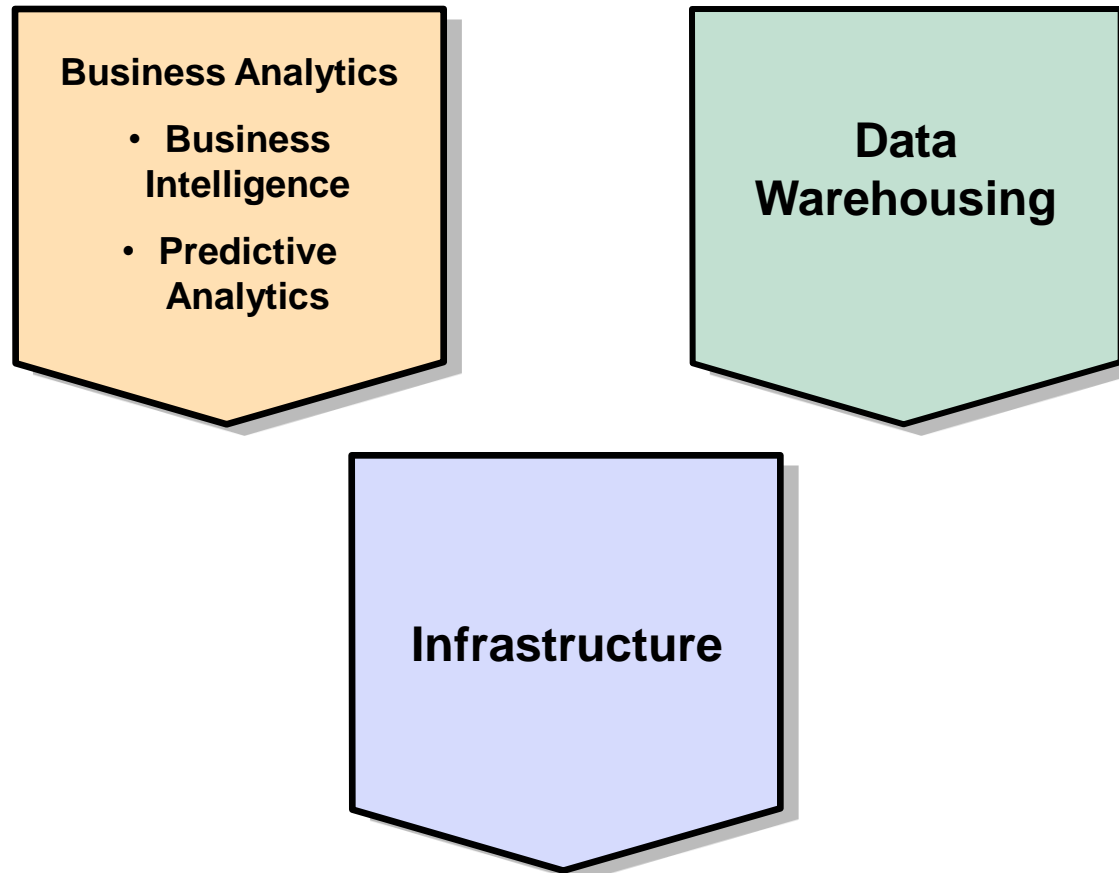
# Forrester said: “delivering successful BI capabilities goes far beyond just the tools and enabling technologies”

*“BI is a set of methodologies, processes, architectures, and technologies”*

*Forrester : Enterprise BI Survey Q&A: BI Professionals Recognize The Need To Focus Beyond Tools, March 17, 2009*



# Key Business Analytics Capabilities for Success



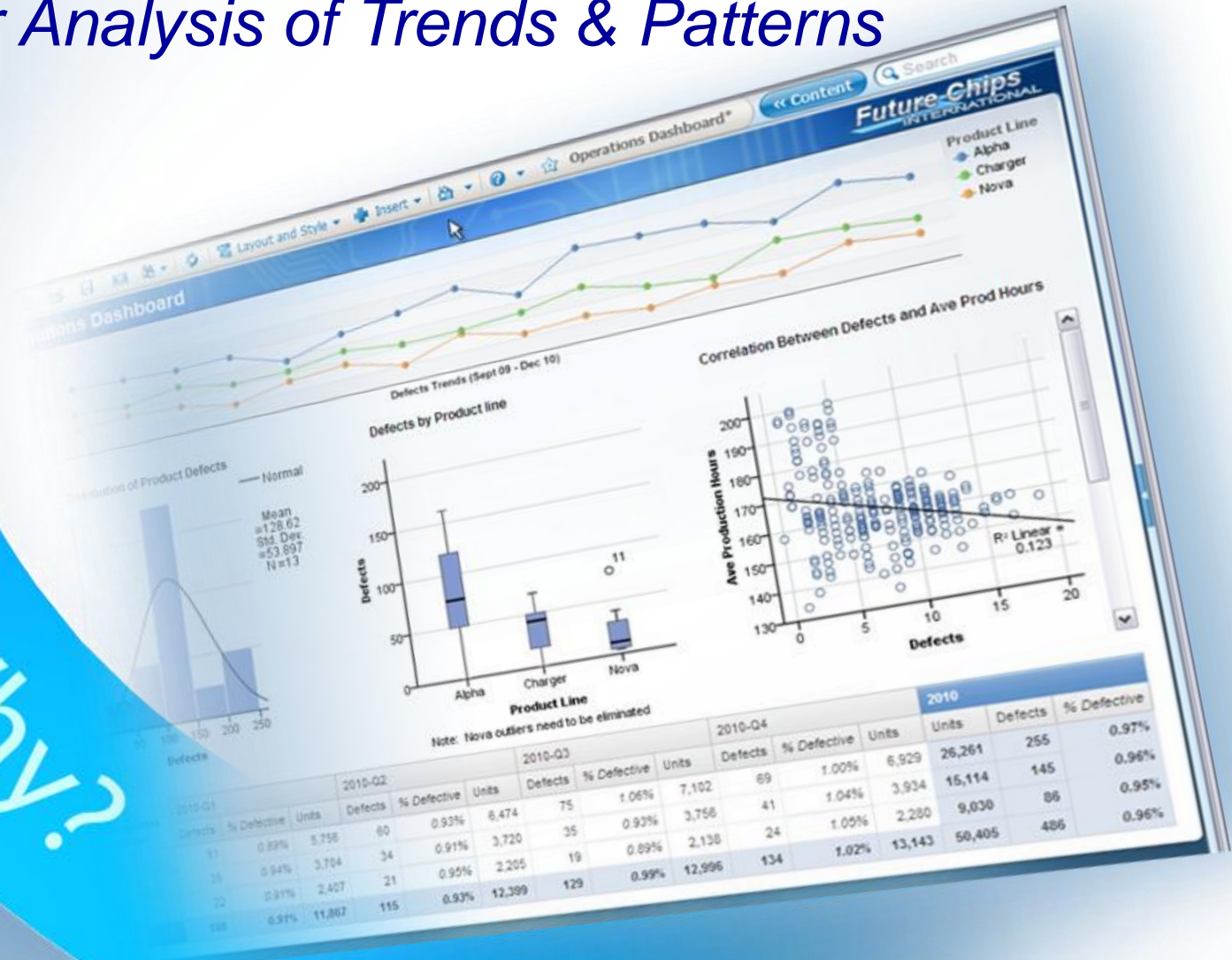
# ➤ Immediate Insights to Business Performance



How are we doing?

# ➤ Deeper Analysis of Trends & Patterns

Why?



# ➤ Foresight to Plan & Allocate Resources

The screenshot shows the IBM Business Process Manager (BPM) interface for rule-based decision making. The main window is titled "insurance\_claims\_manage..." and has tabs for "Define", "Combine", "Deploy", and "Reports". The interface is divided into several sections:

- Automotive Properties**: A section for defining claim areas.
- Choose Who This Claim Area Applies to**: A section for defining the scope of the claim area.
- Use Rules to Decide Which Action is Triggered**: A section for defining rules that trigger actions based on risk points.

The "Use Rules to Decide Which Action is Triggered" section contains a table of rules with the following columns: Rule name, Risk points, Sort, and Remainder. The rules are:

Rule name	Risk points	Sort	Remainder
1 Police Intervention	1	▲▲	Appl
2 Multiple Claims	3	▲▲	Export
3 Cost over 5k	2	▲▲	Remove
4 Cost over 3k	1	▲▲	Remove
5 Material and Injury Claim	1	▲▲	Remove
Remainder	0		Remove

Below the table, there are sections for "Allocate to" (with options: Refer, Standard, Fast track) and "Measure" (with option: Propensity). The interface also includes buttons for "Add Action", "Add annotations", "OR", "Split OR", "Find an existing rule", "Create a new rule", and "Export".

What should we be doing?

# Moving from Reactions to Predictions

## SMART IS

### Turning a Call Center in a Profit Center.



A large Dutch financial services company implemented predictive cross selling programs in its call centers. The implementation took 2 months and generated **\$30 Million in incremental sales**. Essentially, 1M calls generated 180,000 suggestions, reps made 60,000 offers turning into 30,000 leading to 22,000 sales.

## SMART IS

### Turning clients into advocates.



A large Swiss telco provider adopted a client retention approach based on satisfaction. Based on the use of the “Wisdom of Crowds” principle, gathering feedback. The company **reduced churn from 14% to 2%**.

## SMART IS

### Preventing crime before it happens.



A large city in the US turned to predictive analytics to predict occurrences of crimes in four blocks radius in tranche of 4 hours. Insights led to optimized deployment of police resources **reducing homicides by 35%** year over year, and robberies by 20%.

## SMART IS

### Dramatically lowering the cost of claims.

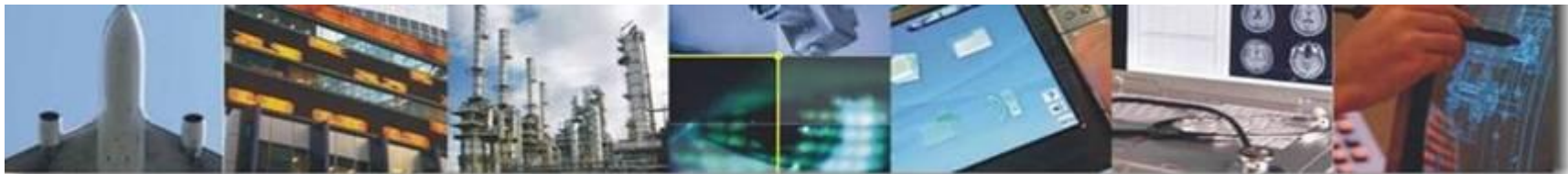


A large US insurer has embedded predictive analytics in claims handling while maximizing and accelerating the collection of subrogation payment. The company achieved an **ROI of 403% with payback in 3 months**.

# Why Predictive Analytics on System z?

- **Analytics is becoming mission critical**
- **The volumes of data that need to be analyzed is huge**
  - Much of this data resides on System z
  - Overhead of moving this data is significant
- **Several apps that need to consume Predictive Analytics outcomes are on System z**

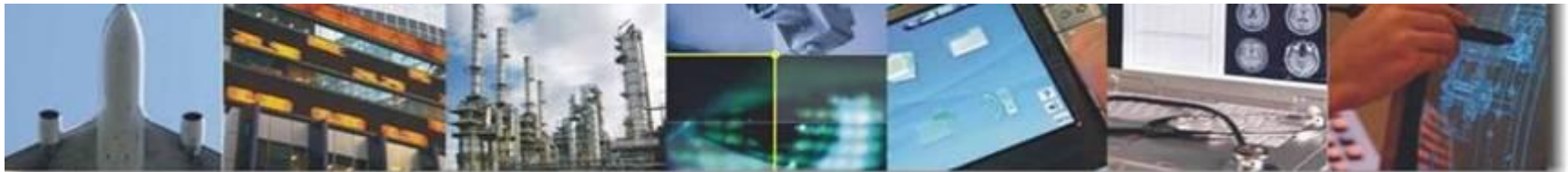
<p>High business growth</p>	<p>Continuous business operations</p>	<p>Flexibility and speed to respond</p>
<p>Reduce business risk</p>	<p>Green strategy Running out of energy and space</p>	<p>Secure Cloud Services</p>





Several applications that need to consume Predictive Analytics outcomes are on System z

<b>Banking</b>	<b>Insurance</b>	<b>Retail</b>	<b>Healthcare</b>	<b>Public Sector</b>
<i>Core Banking</i>	<i>Internet Rate Quotes</i>	<i>On-line Catalog</i>	<i>Patient Care Systems</i>	<i>Electronic IRS</i>
<i>Wholesale Banking – Payments</i>	<i>Policy Sales &amp; Management (e.g. Life, Annuity, Auto)</i>	<i>Supply Chain Management</i>	<i>On-line Claims Submission &amp; Payments</i>	<i>Web based Social Security</i>
<i>Customer Care &amp; Insight</i>	<i>Claims Processing</i>	<i>Customer Analysis</i>		<i>Tax processing</i>



# Predictive analytic solutions add value to those applications

Banking	Insurance	Retail	Healthcare	Public Sector
<i>Core Banking</i>	<i>Internet Rate Quotes</i>	<i>On-line Catalog</i>	<i>Patient Care Systems</i>	<i>Electronic IRS</i>
<i>Wholesale Banking – Payments</i>	<i>Policy Sales &amp; Management (e.g. Life, Annuity, Auto)</i>	<i>Supply Chain Management</i>	<i>On-line Claims Submission &amp; Payments</i>	<i>Web based Social Security</i>
<i>Customer Care &amp; Insight</i>	<i>Claims Processing</i>	<i>Customer Analysis</i>		<i>Tax processing</i>

 <p><b>Banking</b></p> <ul style="list-style-type: none"> <li>• Customer Intimacy &amp; Offer Optimization</li> <li>• Integration into Enterprise Risk</li> </ul>	 <p><b>Insurance</b></p> <ul style="list-style-type: none"> <li>• Cross-sell &amp; Retention</li> <li>• Risk-based Claims Processing</li> </ul>	 <p><b>Retail</b></p> <ul style="list-style-type: none"> <li>• Market Basket Analysis</li> <li>• Assortment Planning</li> </ul>	 <p><b>Healthcare</b></p> <ul style="list-style-type: none"> <li>• Evidence based healthcare</li> </ul>	 <p><b>Public Sector</b></p> <ul style="list-style-type: none"> <li>• Policing and Crime prevention</li> <li>• Human Capital Management</li> </ul>
---	--	--	--	---



# IBM System z: A premier analytic platform

A successful strategy requires the integration of all key components

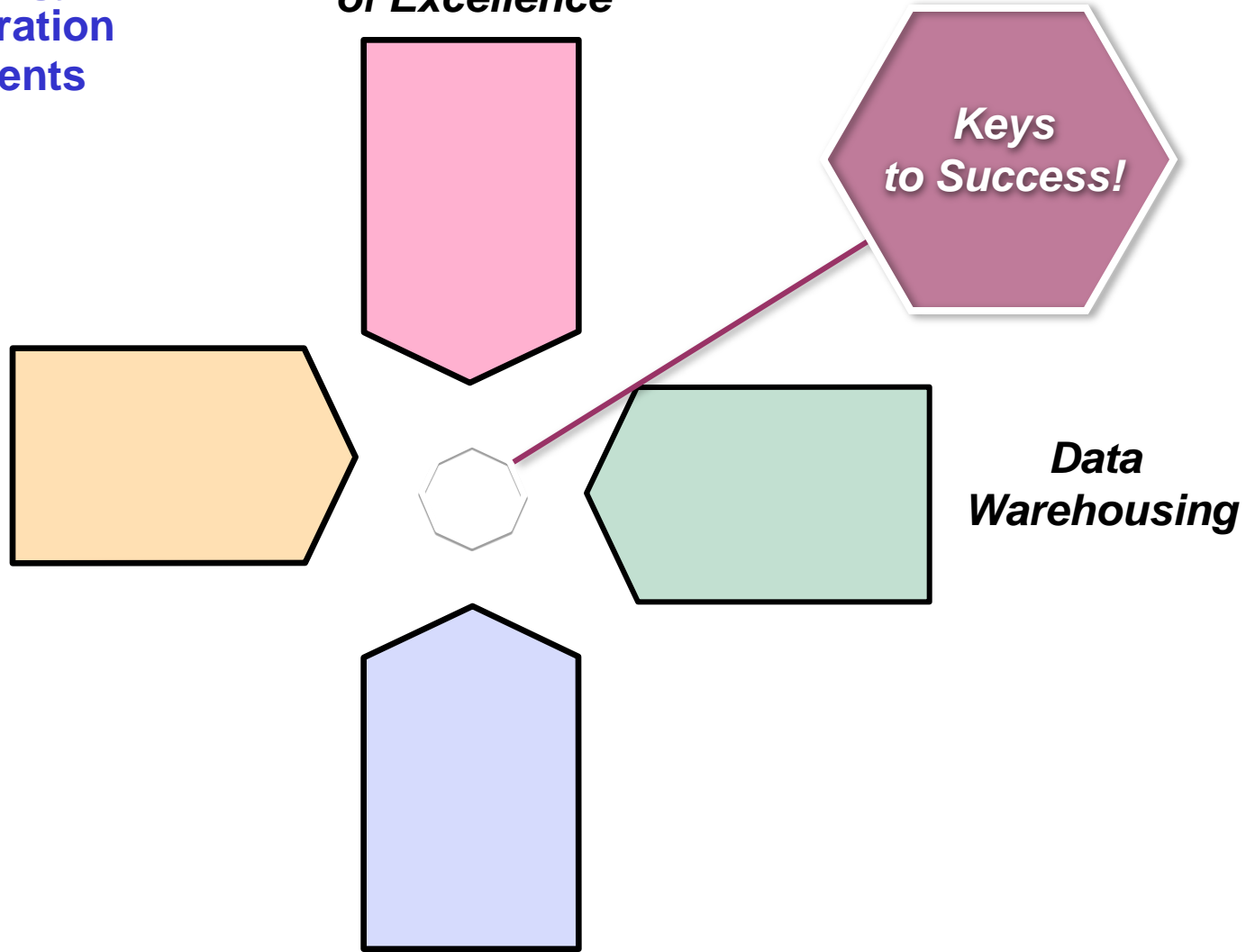
**Community  
of Excellence**

**Keys  
to Success!**

**Business  
Analytics**  
(Business Intelligence &  
Predictive Analytics)

**Data  
Warehousing**

**Infrastructure**





## Miami-Dade County

Selects IBM System z platform to expand their IBM Cognos 8 BI enterprise infrastructure



*...We are now able to expand the usage of our Business Intelligence reporting. By the end of 2010, we will have users from over 42 County departments with over 1500 users creating and consuming reports with stable environments on System z.*



- Jaci Newmark, Project Lead, Enterprise Business Intelligence Architecture,  
Miami-Dade County

- 11 days to go from distributed to System z deployment model
- Consolidated multiple BI deployments onto a single platform
- Consolidate multiple, disparate data sources onto a single platform
- Ensured 99.999% availability & complete disaster recovery plan



## Blue Insight

*The IBM internal Private Analytics Cloud*



“

*Our commitment to informed decision making led us to consider private cloud delivery of Cognos via System z, which is the enabling foundation that makes possible **+\$25M savings over 5 years.***

”

*- IBM CIO Office*

- Consolidated 115 multi-product, departmental BI deployments to 1 Cognos 8 BI on System z
- Support for our global workforce (2009: 72K, 2010: 130K, 2011: **300K**)
- Realizing value from +60 data sources across IBM
- Projected \$25M in savings (60% Consolidation, 35% Standardization, 5% Automation)
- **Integrated Predictive Analytics**

# IBM Product Portfolio Business Analytics and Data Warehousing on System z

## Business Intelligence

- Cognos Business Intelligence for Linux on System z **and z/OS**

## Predictive Analytics

- SPSS Statistics
- SPSS Modeler
- SPSS Collaboration and Deployment Services
- SPSS Decision Management

## Data Warehousing

- DB2 for z/OS
- DB2 Utilities Suite
- InfoSphere Warehouse
- DB2 Analytics Accelerator

*\*Solution Edition for Data Warehousing (pricing option)*

## Data integration and movement

- InfoSphere Information Server
- InfoSphere Change Data Capture
- InfoSphere Replication
- InfoSphere Federation
- Global Name Recognition

## Master data management

- InfoSphere Master Data Management Server

## InfoSphere industry models

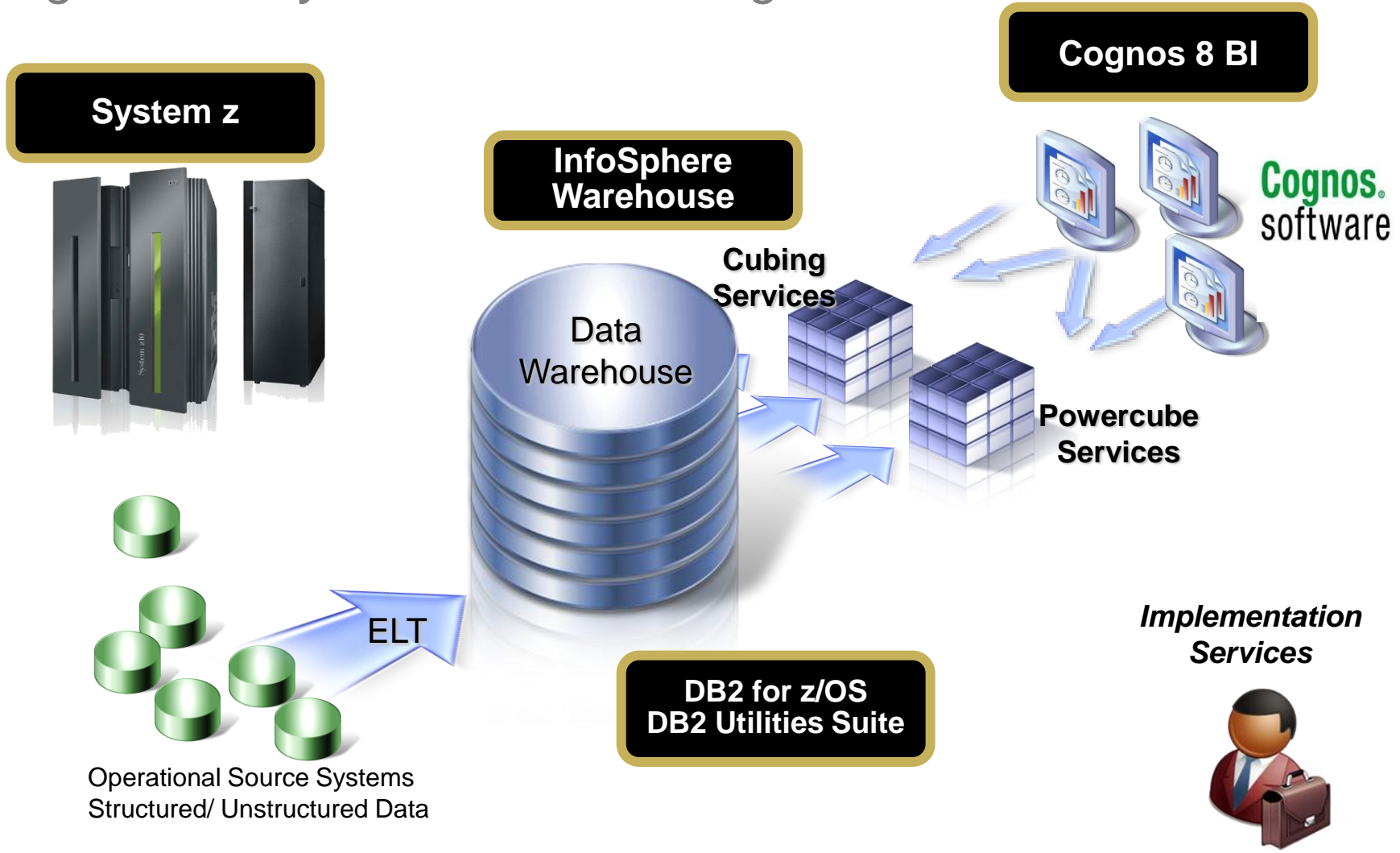
- Banking, Insurance, Retail, Telco, Health Payor, Health Provider, Financial Markets

## Flexible deployment options

- IBM Smart Analytics System 9700/9710
- IBM Smart Analytics Cloud
- IBM Services

# IBM Smart Analytics System 9700 / 9710

*High Value Dynamic Warehousing*





Thank  
YOU



# Disclaimer/Trademarks

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.

**The information on the new products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information on the new products is for informational purposes only and may not be incorporated into any contract. The information on the new products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. The development, release, and timing of any features or functionality described for our products remains at our sole discretion.**

This information may contain 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.

Trademarks The following terms are trademarks or registered trademarks of other companies and have been used in at least one of the pages of the presentation:

The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both: DB2 Universal Database, eServer, FlashCopy, IBM, IMS, iSeries, Tivoli, z/OS, zSeries, Guardium, IBM Smart Analytics Optimizer, Data Encryption Tool for IMS and DB2 Databases, DB2 Administration Tool / DB2 Object Compare for z/OS, DB2 Audit Management Expert 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 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

EMC and TimeFinder are trademarks of EMC Corporation

Hitachi is a trademark of Hitachi Ltd

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.