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Relational Database Solutions

IBM Data Strategy

DB2 101

Premier Business Partner IBM

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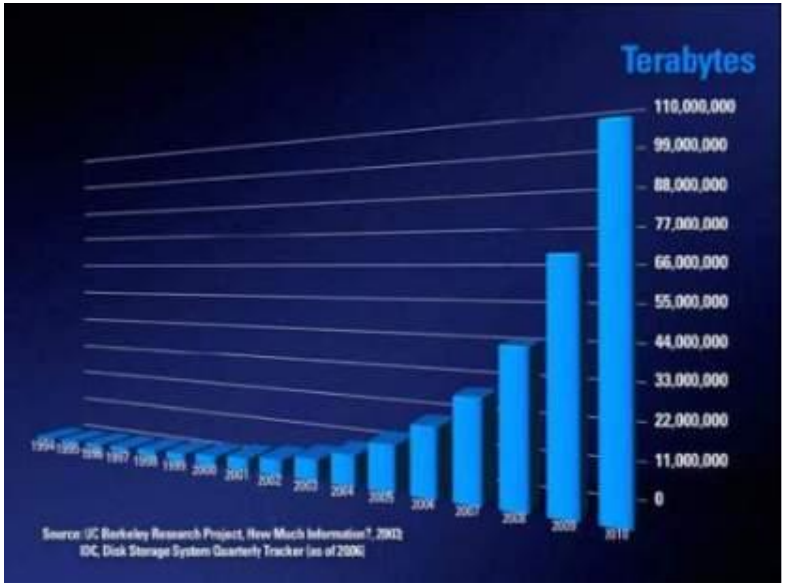
Agenda

- The Fillmore Group, IBM Business Partner
- What's New in 2013?
- Data Governance
- Information Integration
- Data Warehouse and Big Data
- Mainframe Update
- Competing with Oracle



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The Fillmore Group, Inc.

- Frank Fillmore, DB2 Gold Consultant, IBM Champion
- Kim May, IBM Champion
- Dozens of experienced, certified consultants
- Information Management Consulting Services
- IBM Authorized Training Partner
- IBM Information Management Software Reseller

IBM CHAMPION

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Services

- DB2 – implementation, migration, and tuning
- BigData
  - BigInsights (IBM's Hadoop distribution)
  - InfoSphere Streams
- Data Governance tools
- Information Integration
- Data Warehousing

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IBM Authorized Training

- Exclusive NA provider of IBM BigData training
  - DW611 "IBM InfoSphere BigInsights Foundation"
  - DW641 "BigInsights Analytics for Business Analysts"
  - DW652 "BigInsights Analytics for Programmers"
  - DW723 "Programming for InfoSphere Streams V3 with SPL"
  - DW731 "Administration of InfoSphere Streams V3"
- DB2, InfoSphere, Information Server, Optim

Authorized
IBM Training

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IBM 2013 News

- PureData System for Hadoop
  - 8x faster deployment than custom-built solutions
  - First appliance with built-in analytics accelerator
  - Only Hadoop system with built-in archiving tools
- DB2 for LUW v10.5 with **BLU Acceleration**
  - 8-25x faster reporting and analytics
  - 10x storage space savings seen during beta test
  - No indexes, aggregates, tuning, or SQL / schema changes

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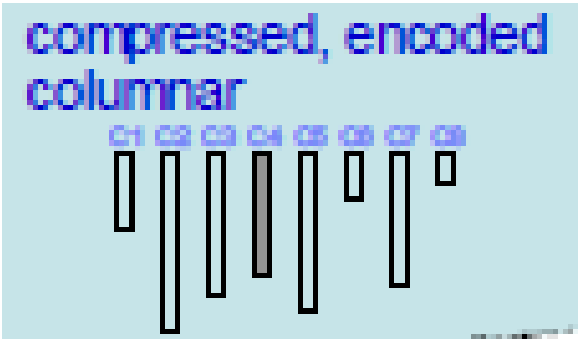
BLU Acceleration



- Dynamic In-Memory
  - In-memory *columnar* processing
  - Dynamic movement of data from storage
- Actionable Compression
  - Patented compression technique that preserves order so that the data can be used without decompressing
- Parallel Vector Processing
  - Multi-core and SIMD parallelism
  - (Single Instruction Multiple Data)
- Data Skipping
  - Skips unnecessary processing of irrelevant data

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What's in the Information Management portfolio?

- Data Servers - DB2 AESE bundle
- Data Governance
- Information Integration
- Data Warehouse

2013 IBM Portfolio

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DB2	DB2 pureScale	DB2 Data Partitioning Facility	DB2 with BLU Acceleration (New)
Single Instance (scale-up)	Clustered Database (scale-out)	Partitioned Database (scale-out)	Columnar Compression Database
Scalable Basic Read/write Rapid deployment Storage efficient Multi-tenancy SSD-aware?	Massive scale Non-partitionable Transactional Read/write Highly Available High concurrency Fast response time Storage efficient Multi-tenancy **"shared disk"**	Massive scale Partitionable Analytic Read-mostly Mixed query types High concurrency High throughput Storage efficient Multi-tenancy **"shared nothing"**	Memory scale Ultra-high speed Analytic Read-mostly Column store Column compressed Very storage efficient

PureData System for Transactions

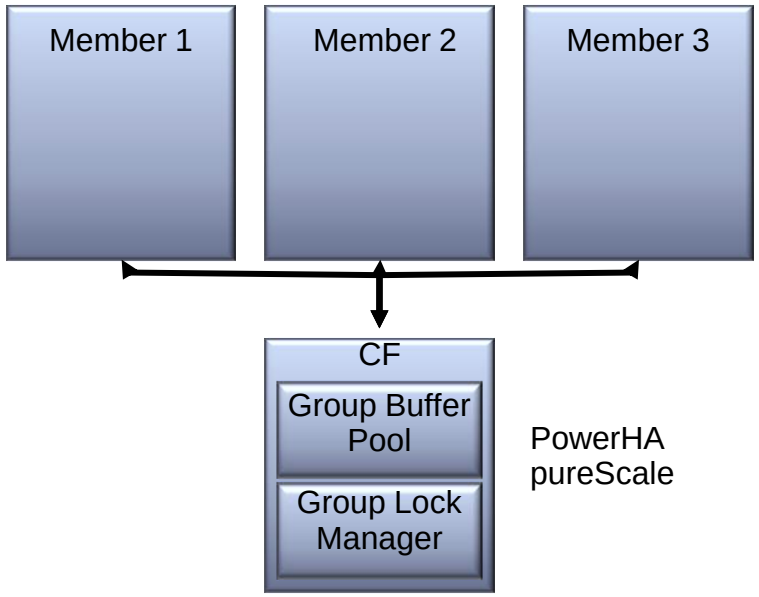
PureData System For Operational Analytics

DB2 pureScale

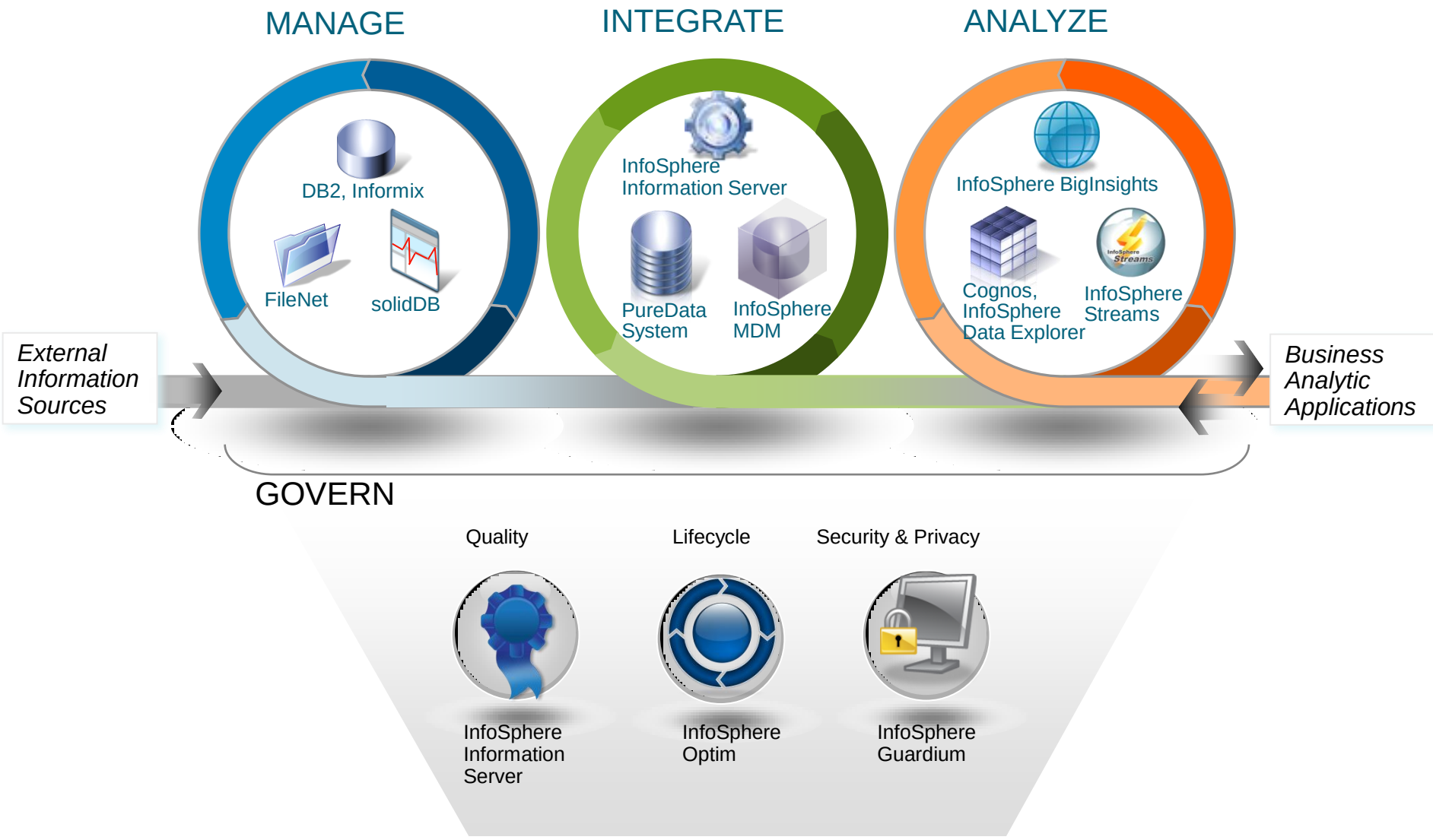
- Unlimited Capacity
  - Buy only what you need, add capacity as your needs grow
- Application Transparency
  - Avoid the risk and cost of application changes
- Continuous Availability
  - Deliver uninterrupted access to your data with consistent performance

pureScale - Scalability and High Availability

- Efficient Centralized Locking and Caching
  - As the cluster grows, DB2 maintains one place to go for locking information and shared pages
  - Optimized for very high speed access
    - DB2 pureScale uses Remote Direct Memory Access (RDMA) to communicate with the powerHA pureScale server
    - No IP socket calls, no interrupts, no context switching
- Results
  - Near Linear Scalability to large numbers of servers
  - Constant awareness of what each member is doing
    - If one member fails, no need to block I/O from other members
    - Recovery runs at memory speeds



Delivering trusted information for smarter business decisions – across the entire information supply chain



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Data Governance

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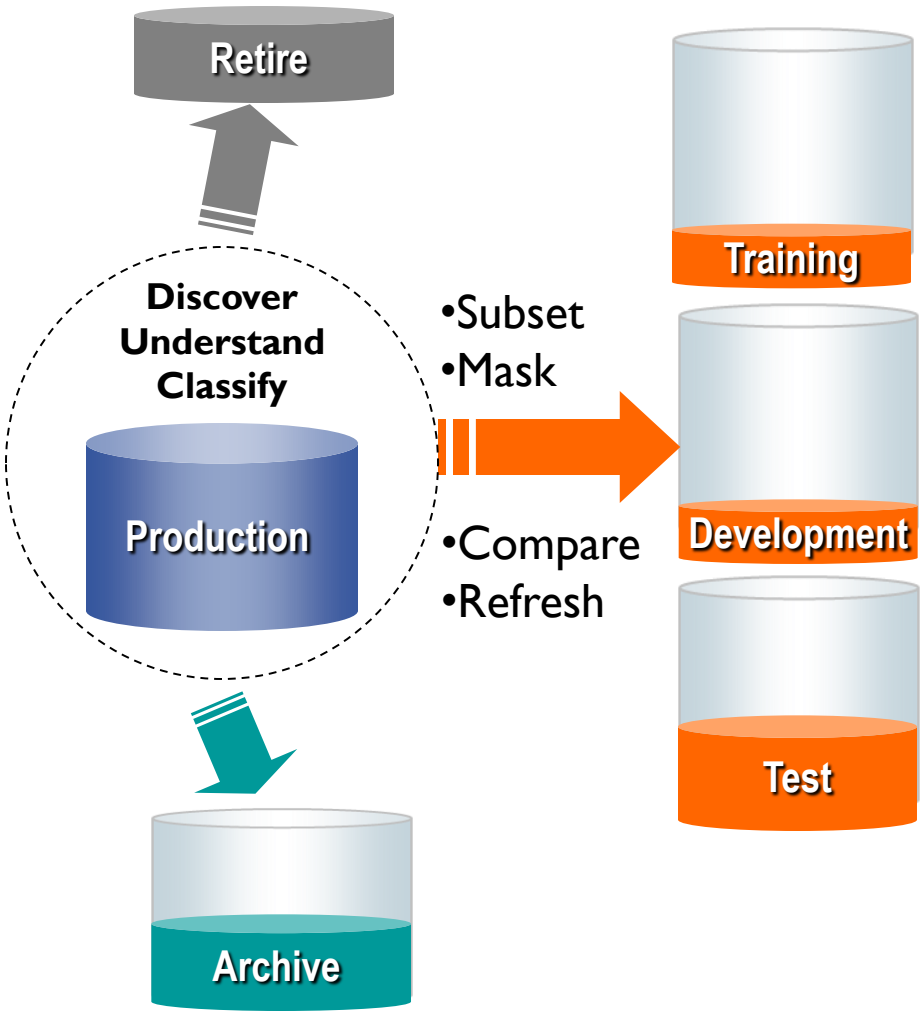
IBM Optim solutions

Managing data throughout its lifecycle in heterogeneous environments



Discover

- Speed understanding and project time through relationship discovery within and across data sources
- Understand sensitive data to protect and secure it

Test Data Management

- Easily refresh & maintain right sized non-production environments, while reducing storage costs
- Improve application quality and deploy new functionality more quickly

Data Masking

- Protect sensitive information from misuse & fraud
- Prevent data breaches and associated fines

Data Growth Management

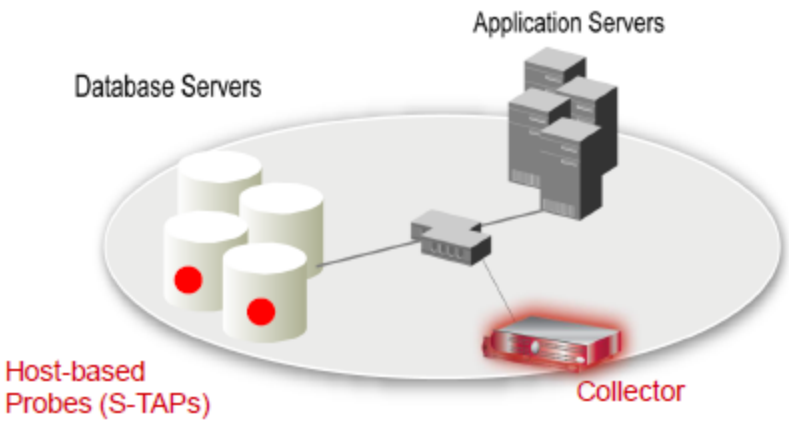
- Reduce hardware, storage & maintenance costs
- Streamline application upgrades and improve application performance

Application Retirement

- Retire legacy & redundant applications while retaining data
- Ensure application-independent access to archive data

InfoSphere Guardium

Real time database monitoring and protection with InfoSphere Guardium



ORACLE · IBM DB2 · Microsoft SharePoint · Microsoft SQL Server · TERADATA · IBM IMS · IBM VSAM · PostgreSQL · NETEZZA · MySQL · IBM Informix · SYBASE

- No DBMS or application changes
- Does not rely on DBMS-resident logs that can easily be erased by attackers, rogue insiders
- 100% visibility including local DBA access
- Minimal performance impact

- Cross-DBMS solution
- Granular, real-time policies & auditing
  - *Who, what, when, how*
- Automated compliance reporting, sign-offs and escalations (financial regulations, PCI DSS, data privacy regulations, etc.)

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InfoSphere Guardium

InfoSphere Guardium allows you to protect your most valuable information

Continuously monitor access to high-value databases to:

1. **Prevent data breaches**

   Mitigate external and internal threats

2. **Ensure the integrity of sensitive data**

   Prevent unauthorized changes to sensitive data or structures

3. **Reduce cost of compliance**

   Automate and centralize controls
   1. Across PCI DSS, data privacy regulations, HIPAA/HITECH, …
   2. Across databases and applications

   Simplify processes

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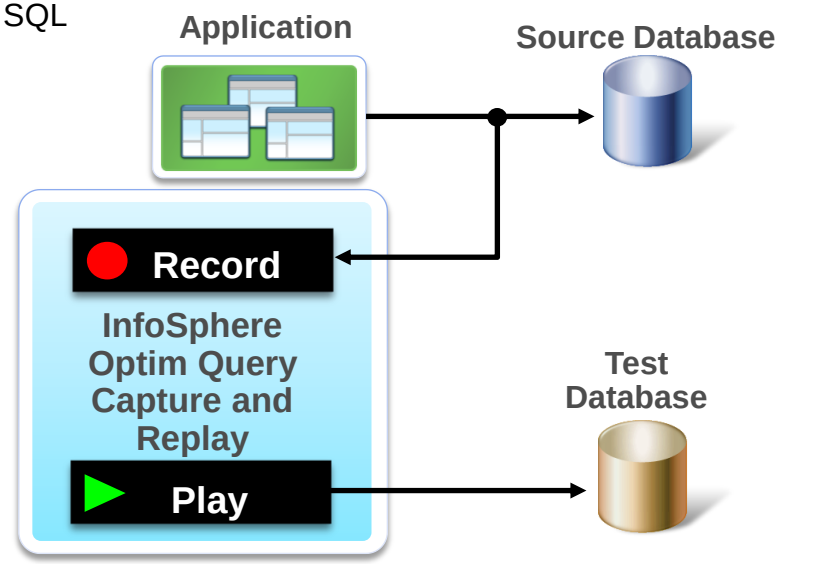
Optim Query Capture and Replay

Record and replay SQL

Capture production workloads and replay them in testing environments



IBM DB2 · IBM Informix · NETEZZA · MySQL · Microsoft SQL Server · ORACLE · TERADATA · SYBASE

Requirements

- Minimize unexpected production problems
- Shorten testing cycles
- Develop more realistic database testing scenarios

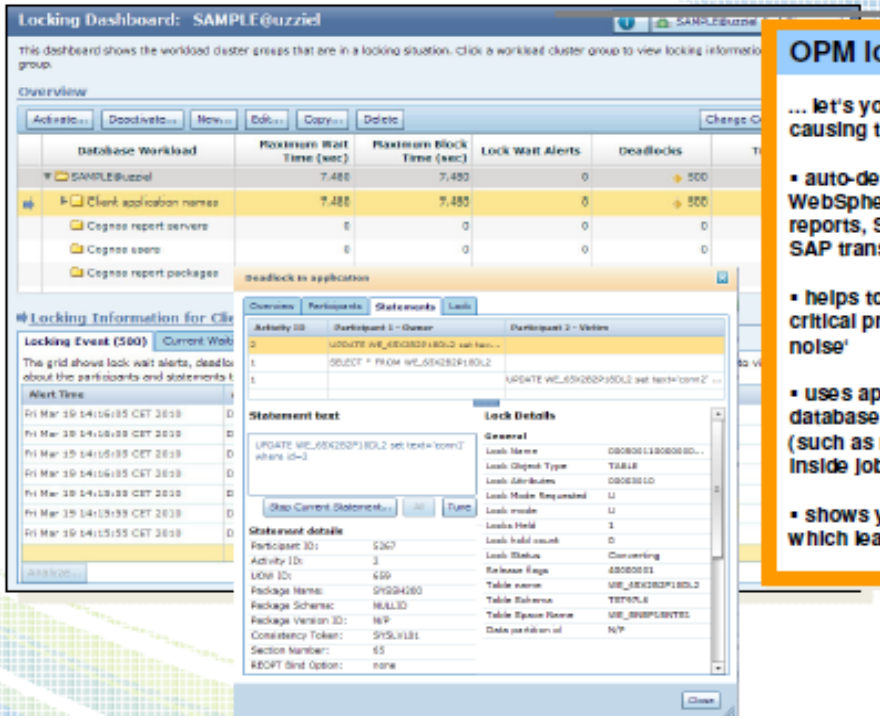
Benefits

- Identify database problems sooner with validation reports and performance tuning
- Use actual production workloads for testing rather than fabricated scenarios
- Extend quality testing efforts to include the data layer

Optim Performance Manager

- Reduce Costs
  - Quicker time to resolution
    - 3 step workflows rather than many screens
    - Close loop process for typical performance problems
  - Integration shortens time to proactively manage performance
    - Same UI
    - OPM lets you check your WLM configuration and helps in creating initial definitions
    - Problematic SQL statements can easily be identified and will then be analyzed in a one-click step with Query Tuner
    - pureQuery tells you exactly where problematic SQL statements are coded
  - Enable transition from heritage Performance Expert to OPM
    - Packages both heritage PE interface and new OPM UI
- Prevent outages and reduce application slowdown Reduce Risk
  - Enhanced WLM management through ?
  - Dashboard Alerting capability
  - Historical performance data available to enable capacity planning
    - Visualizing and aggregation for key performances
    - Averages over time
    - Set granularity so can scale on time and focus
- Decrease time to data value
  - Increasing current staff expertise through IBM knowledge
    - Close loop process for typical performance problem analysis
  - QA Testing is easier so increase confidence to go into production
  - Historical performance data available to enable capacity planning

OPM – Locking Dashboard



OPM locking dashboard

… let's you see the real application which is causing trouble or having problems.

- auto-detects typical applications, such as WebSphere apps, DataStage jobs, Cognos reports, SQL Warehouse operations, or SAP transactions
- helps to differentiate easily between critical problems and just ‚background noise'
- uses application terms instead of database terms to point to root cause area (such as report name, or DataStage step ID inside job)
- shows you also the statement history which lead to a deadlock problem

Add-ons:

- Query Tuner
- Extended Insight

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Information Integration

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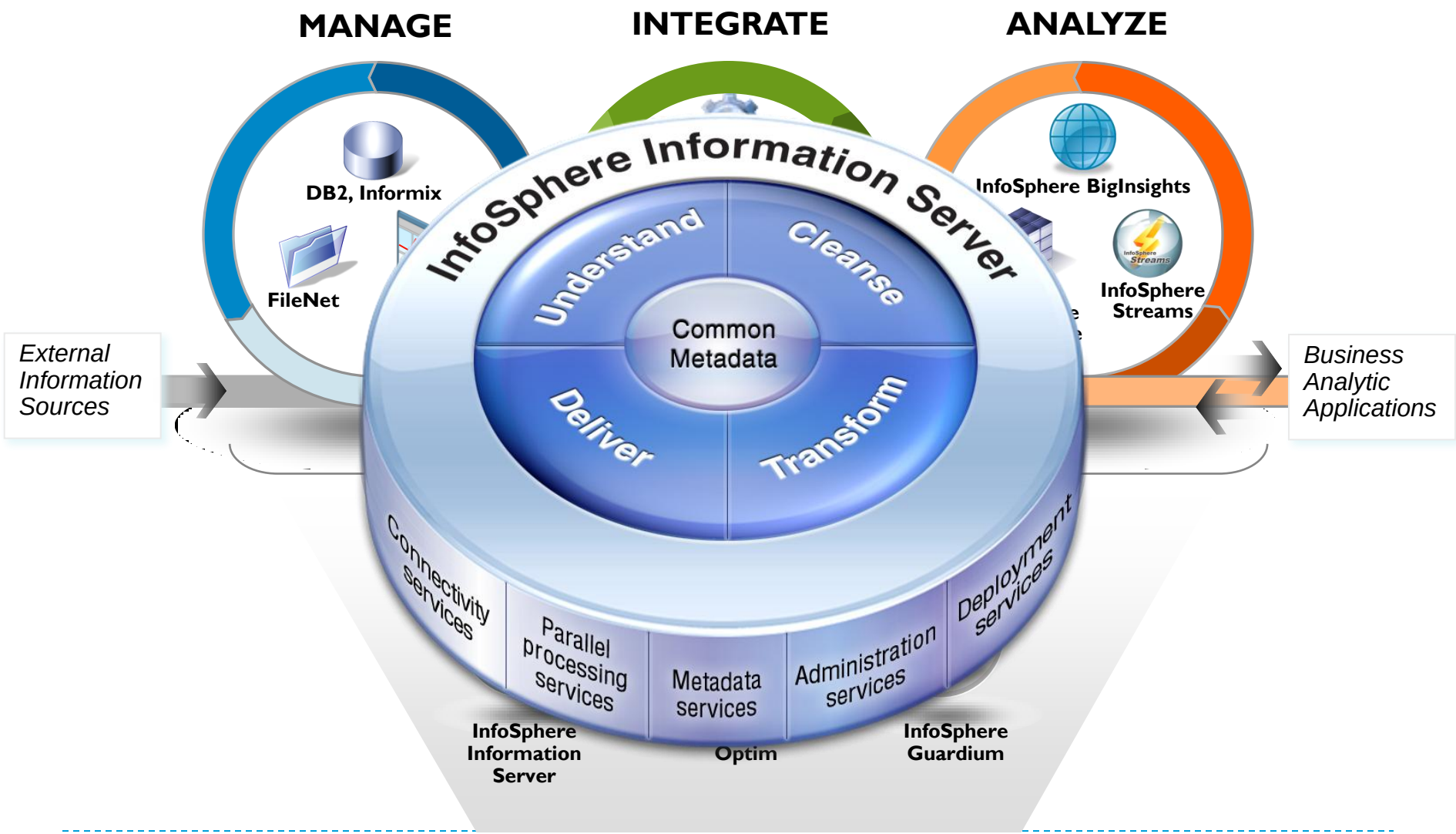
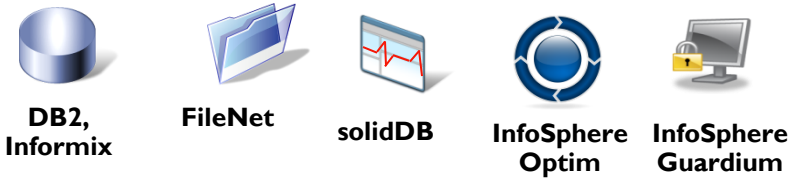
IBM InfoSphere Information Server

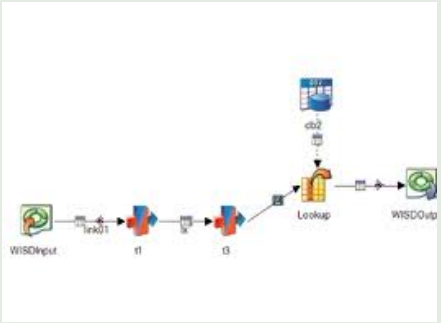


IBM's Information Integration



Organizations Use Integration for...

DataStage, QualityStage

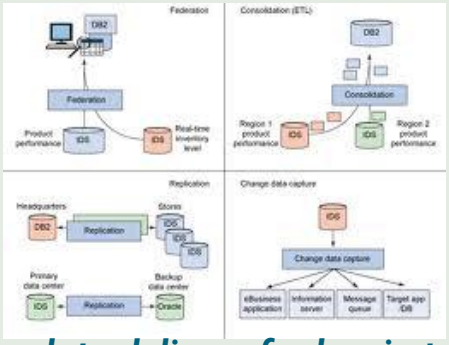


...data loading, cleansing, migrating, movement, high availability and high performance

Foundation Tools

...deep analysis, design, metadata, collaboration and data governance

CDC, Federation, Replication



...data delivery for low impact, timely access to critical business data and operational data requirements

InfoSphere Foundation Tools

Foundation tools help profile, model, define, map and govern information that is spread across your enterprise, so your business can deliver the right information, to the right people, at the right time

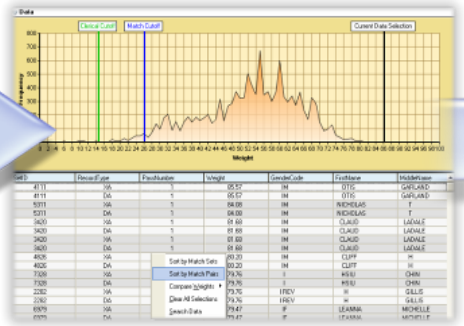
- InfoSphere Information Analyzer
- InfoSphere Information Architect
- InfoSphere FastTrack
- Business Glossary

- Foundation tools are designed to be deployed in a heterogeneous IT environment to leverage existing IT investments.
- They work with any IBM or non-IBM data source, business intelligence tool or operating system -- or in conjunction with the Tools' own comprehensive set of integration products.

InfoSphere QualityStage

QualityStage

Standardize, cleanse and deduplicate data, ensuring a complete, accurate view of information



- **Redundancies**
- **Lack of standards**
- **Unlinked records**
- **Incorrect data**

Complete & accurate view of information

Requirements

- Resolution of data quality issues
- Standardization of data formats
- Cleanse data
- Manage duplicate data
- Enable ongoing quality

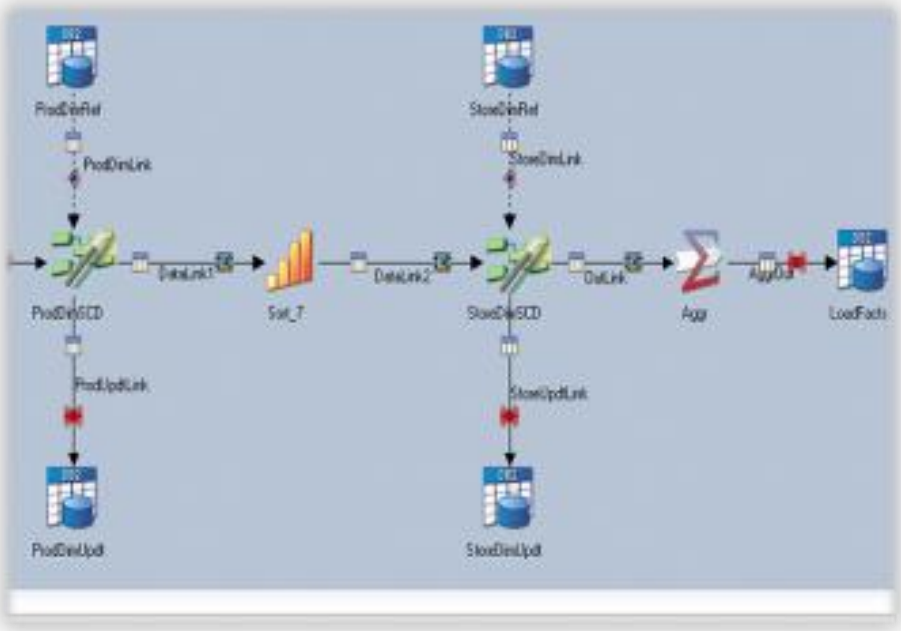
Benefits

- Removes duplicates
- Cross-references matching records
- Survives a single, complete record
- Validate and enriches data

InfoSphere DataStage

DataStage

Integrate, transform and deliver data on demand across multiple sources and targets including databases and enterprise applications



Requirements

- Integrate and transform multiple, complex, and disparate sources of information
- Demand for data is diverse – DW, MDM, Analytics, Applications, and real time

Benefits

- Transform and aggregate any volume of information
- Deliver data in batch or real time through visually designed logic
- Hundreds of built-in transformation functions
- Metadata-driven productivity, enabling collaboration

IBM - InfoSphere Data Replication (IIDR)

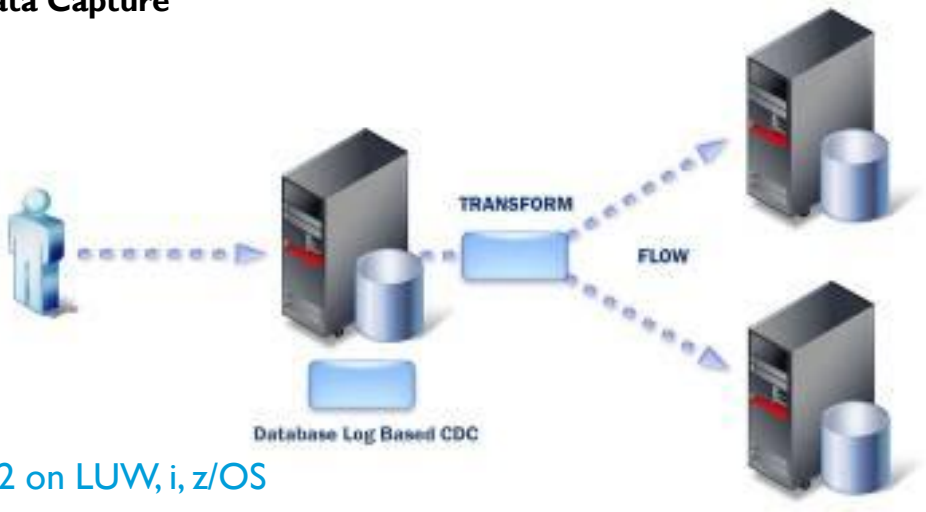
IBM replication technologies – bundled!

- SQL Replication
  - Easy to set up
  - Staging tables
- Q Replication
  - High volume, low latency
  - Native Oracle and DB2 sources and targets
  - WebSphere MQ transport layer
- Change Data Capture (CDC)
  - Broadest set of heterogeneous sources and targets
  - TCP/IP transport layer

InfoSphere Change Data Capture

Change Data Capture

Real-time change data capture and delivery to deliver critical information at the speed of business



- DB2 on LUW, i, z/OS
- Informix
- Oracle
- Sybase ASE
- SQL Server
- PureData System for Analytics (Netezza)

Requirements

- Rapid data delivery for mainly heterogeneous environments
- Minimize CPU utilization on source systems
- Increased visibility into lines of business

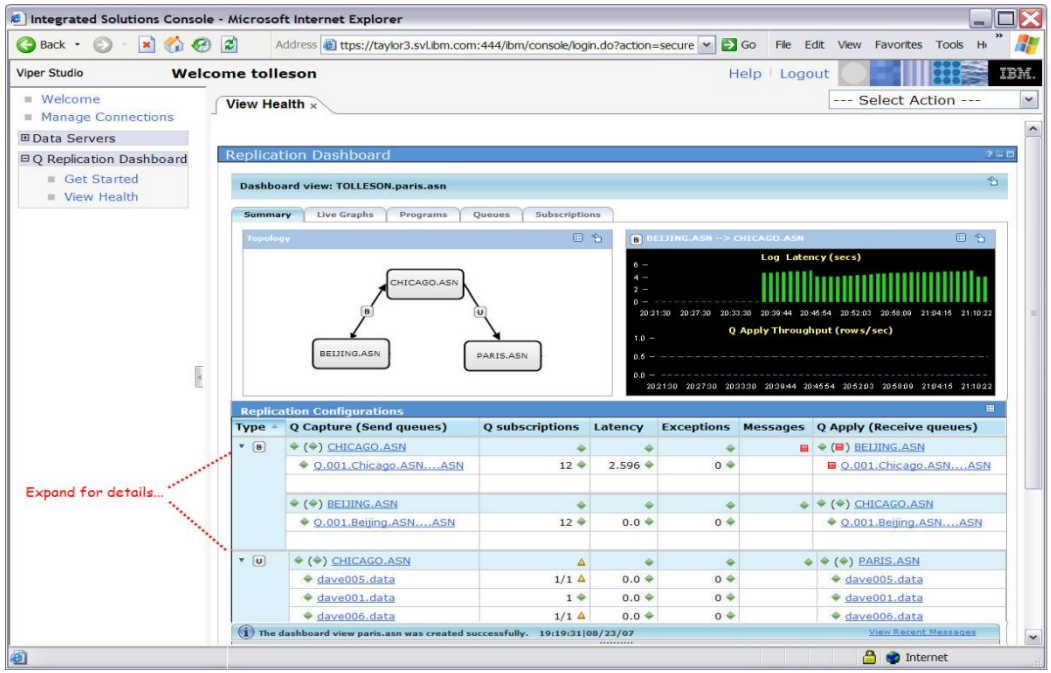
Benefits

- Delivers real-time data for information management projects
- Minimize batch windows to optimize ETL processes
- Flexible implementation for multiple topologies

InfoSphere Replication Server

Replication Server

High volume, low latency data replication for continuous business availability



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Requirements

- Rapid data delivery for DB2 and Oracle environments
- Resiliency to hardware, software, and network failures
- Visibility into replication processes for monitoring

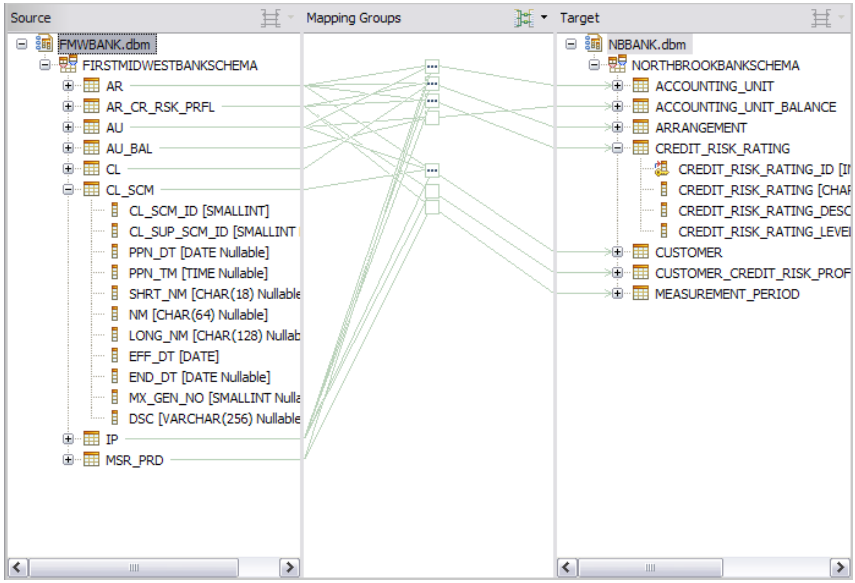
Benefits

- Delivers real-time data for information management projects
- Deep performance monitoring & troubleshooting
- To publish data to MQ, use **InfoSphere Data Event Publisher**

InfoSphere Federation Server

Federation Server

Enable access and delivery of diverse and distributed information as if it were in one system



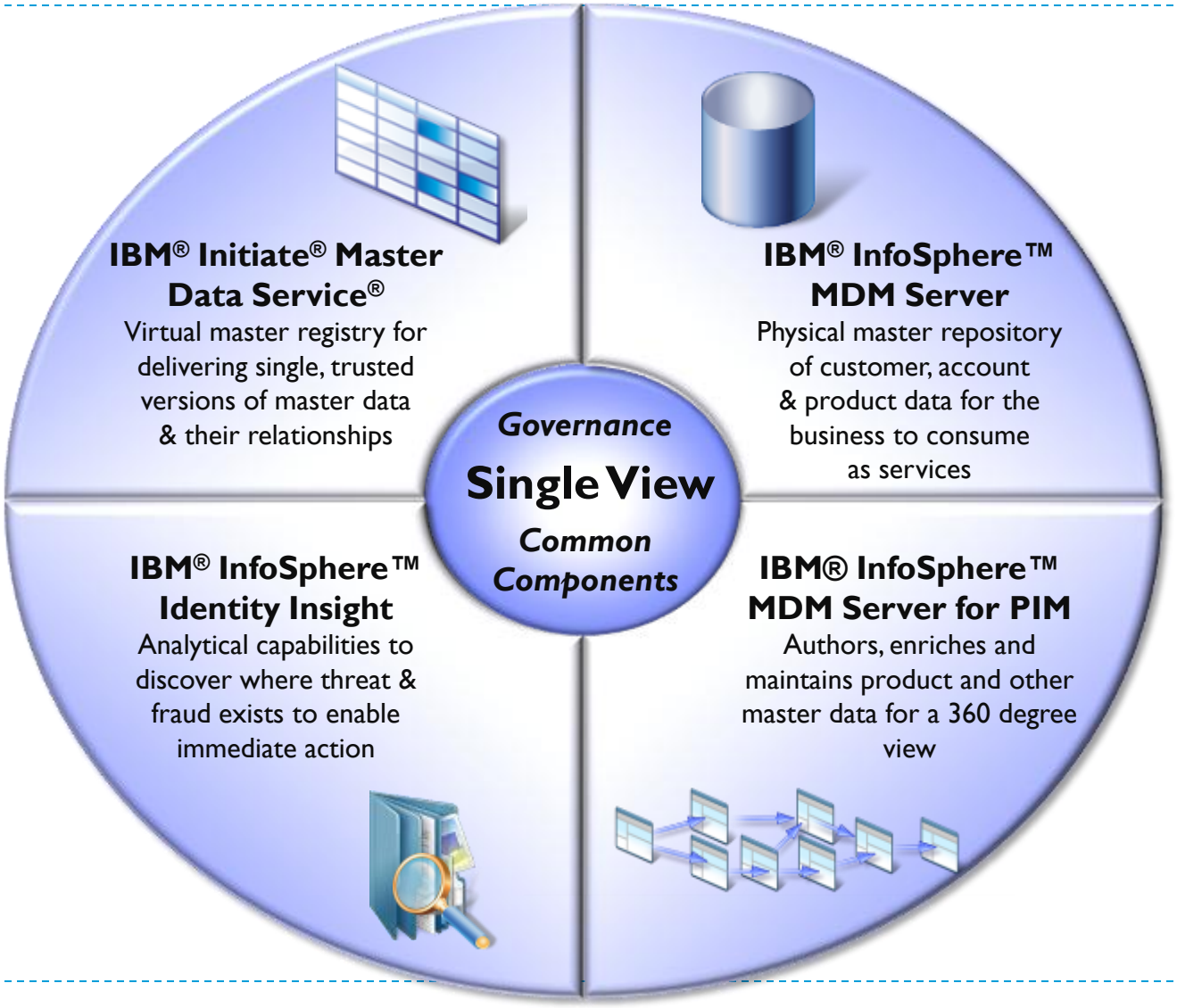
Requirements

- Access to critical information in disparate databases/apps
- Physical replication not viable
- Budget constraints prevent new database purchases

Benefits

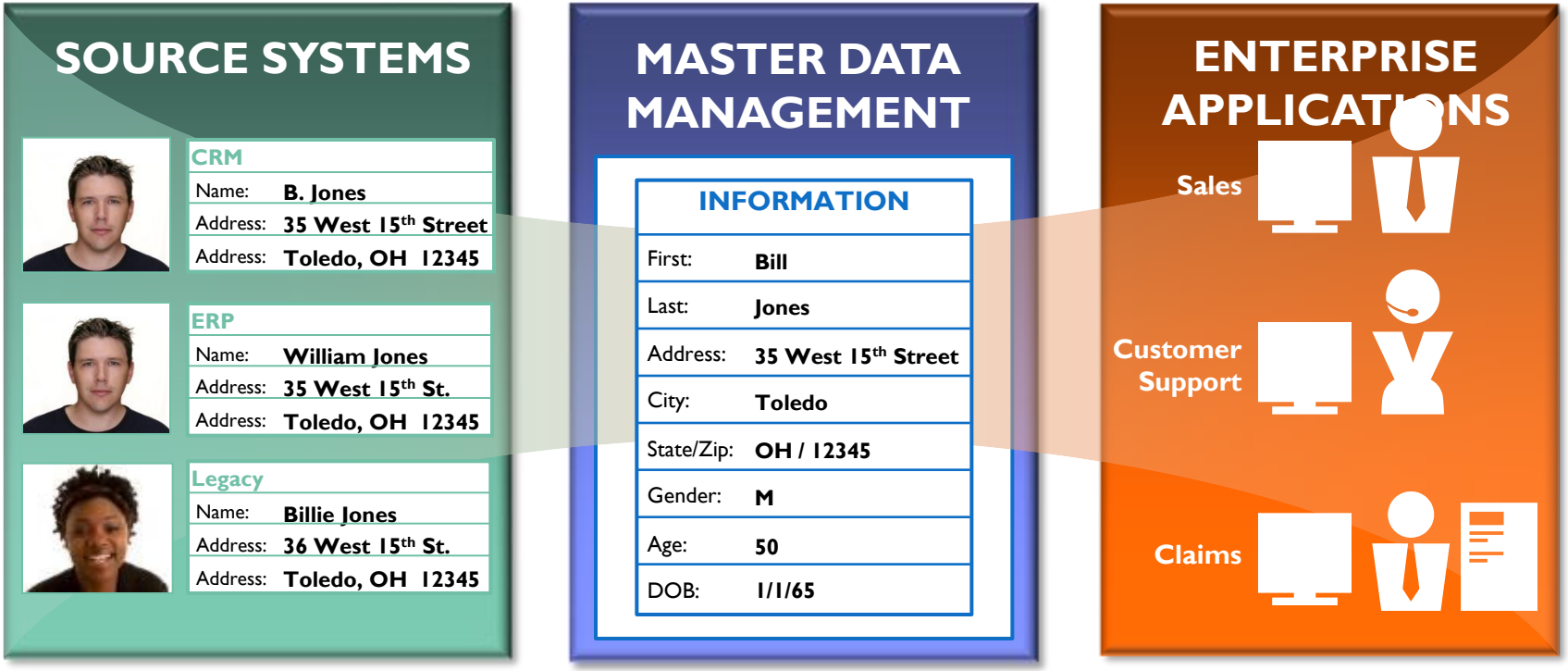
- Virtually consolidates data from multiple lines of business
- Cost-effective point of access to multiple DBs
- Enable SOA with **InfoSphere Information Services Director**

InfoSphere MDM Product Portfolio



What is Master Data Management?

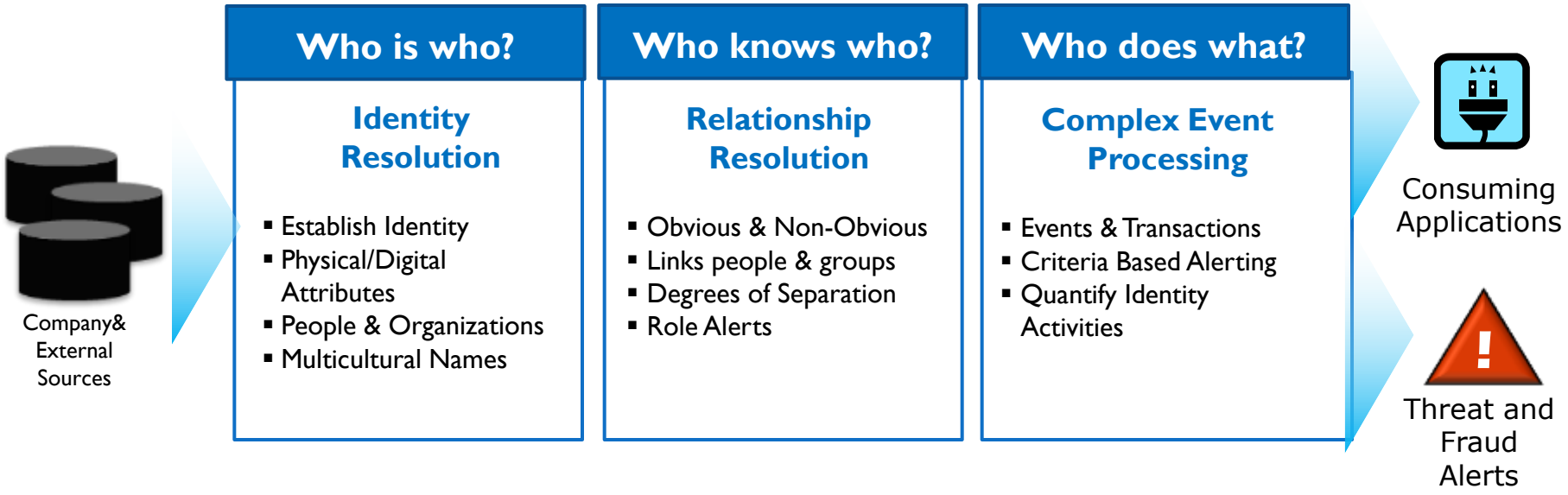
- Discipline that provides a consistent understanding of master data entities (customer, product, etc.)
- A set of functionality for data governance that provides mechanisms & governance for consistent use of master data across the organization
- Is designed to accommodate, control and manage change



IBM provides a cost-effective, rapidly deployable solution to complex customer data management challenges

Entity Resolution and Analysis

…It is used to identify the use of false identities and networks of individuals who are trying to hide their relationships to each other. The same technologies or analyses are used in the detection of fraud networks, racketeering and money-laundering. - *Gartner*



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Data Warehouse and Big Data

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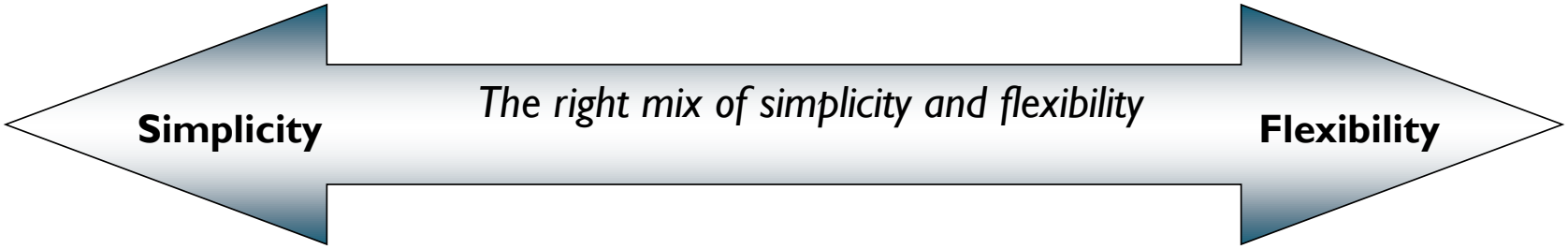
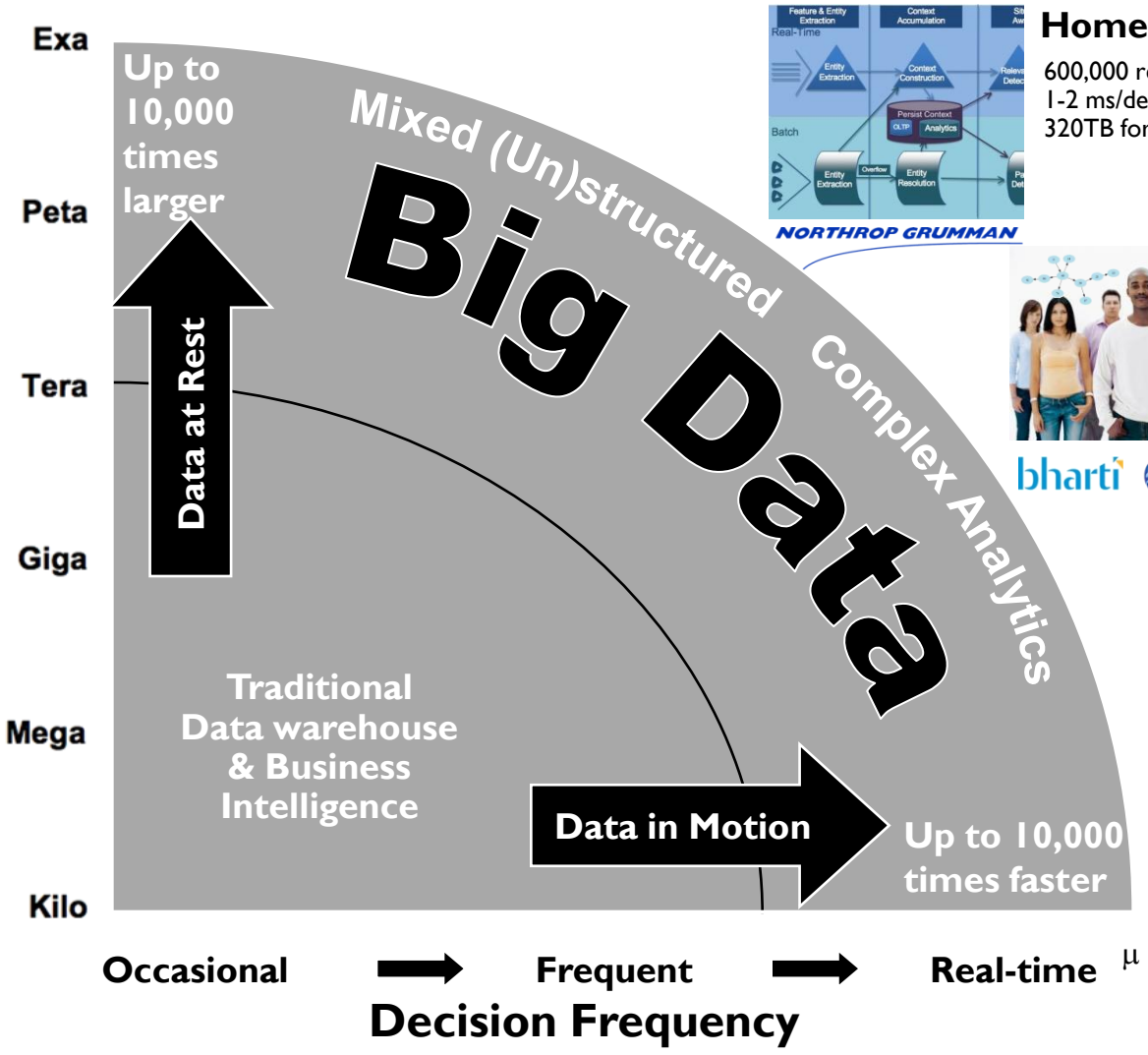
Simplicity, Flexibility, Choice

IBM Data Warehouse & Analytics Solutions

PureData System for Analytics	PureData System for Operational Analytics	DB2 Advanced Enterprise Server Edition v10.5
True Appliance	**Flexible Integrated System**	**Custom Solution**
• IBM investment in solution design, integration and upgrades • Speed and ease of deployment and administration • Optimized performance for a specific workload range	• IBM investment in solution design, integration and upgrades • Flexibility of multiple options - platform, capacity, and integrated software • Customizable to optimize for a range and mix of workloads	• Client investment in solution design, integration and upgrades • Complete flexibility to mix and optimize software, servers and storage for the complete range and mix of workloads



Why "Big Data"?



NORTHROP GRUMMAN

Homeland Security

600,000 records/sec, 50B/day
1-2 ms/decision
320TB for Deep Analytics

bharti Globe

Telco Promotions

100,000records/sec, 6B/day

10 ms/decision

270TB for Predictive Analytics

BEST BUY

GameStop power to the players

Multi-Channel sales

Weblogs and transactions

Predictive analytics to up sell and cross sell

1 sec/decision

Smart Traffic

250K GPS probes/sec

630K segments/sec

2 ms/decision, 4K vehicles

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1 – Unlock Big Data

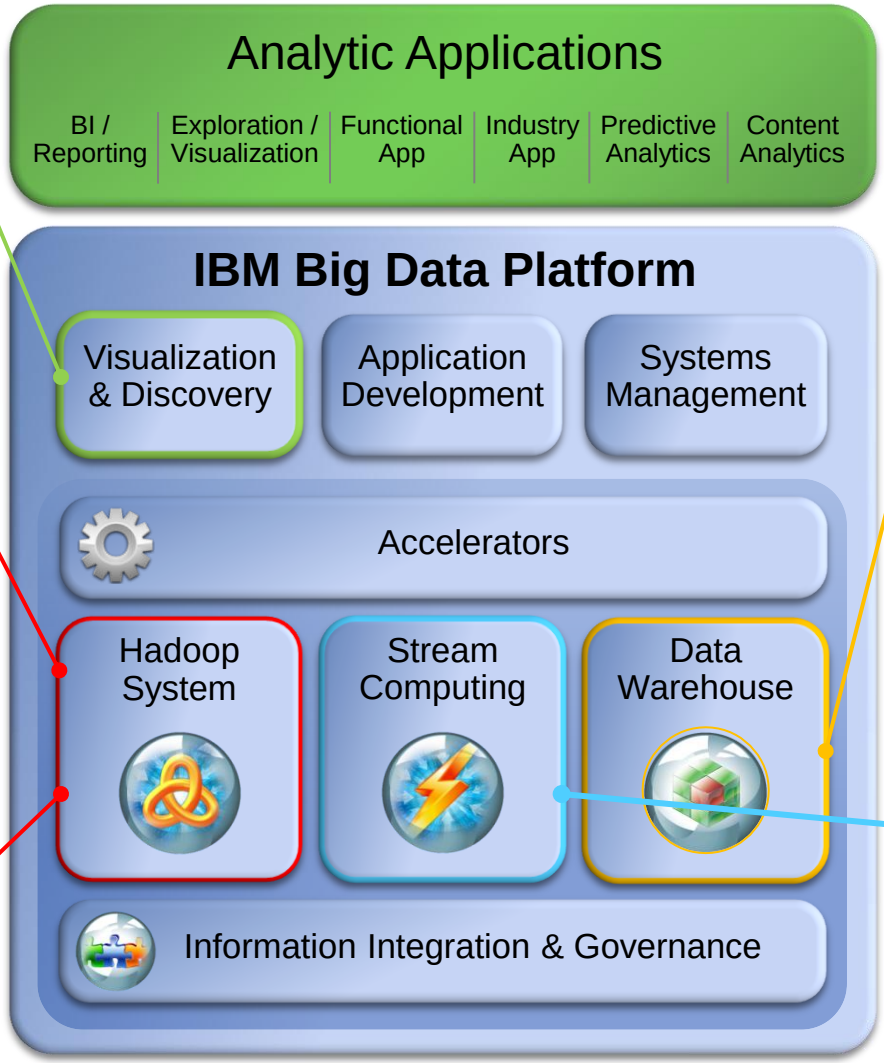
InfoSphere Data Explorer

2 – Analyze Raw Rata

InfoSphere BigInsights

4 – Reduce costs with Hadoop

InfoSphere BigInsights



3 – Simplify your warehouse

PureData System for Analytics

5 – Analyze Streaming Data

InfoSphere Streams

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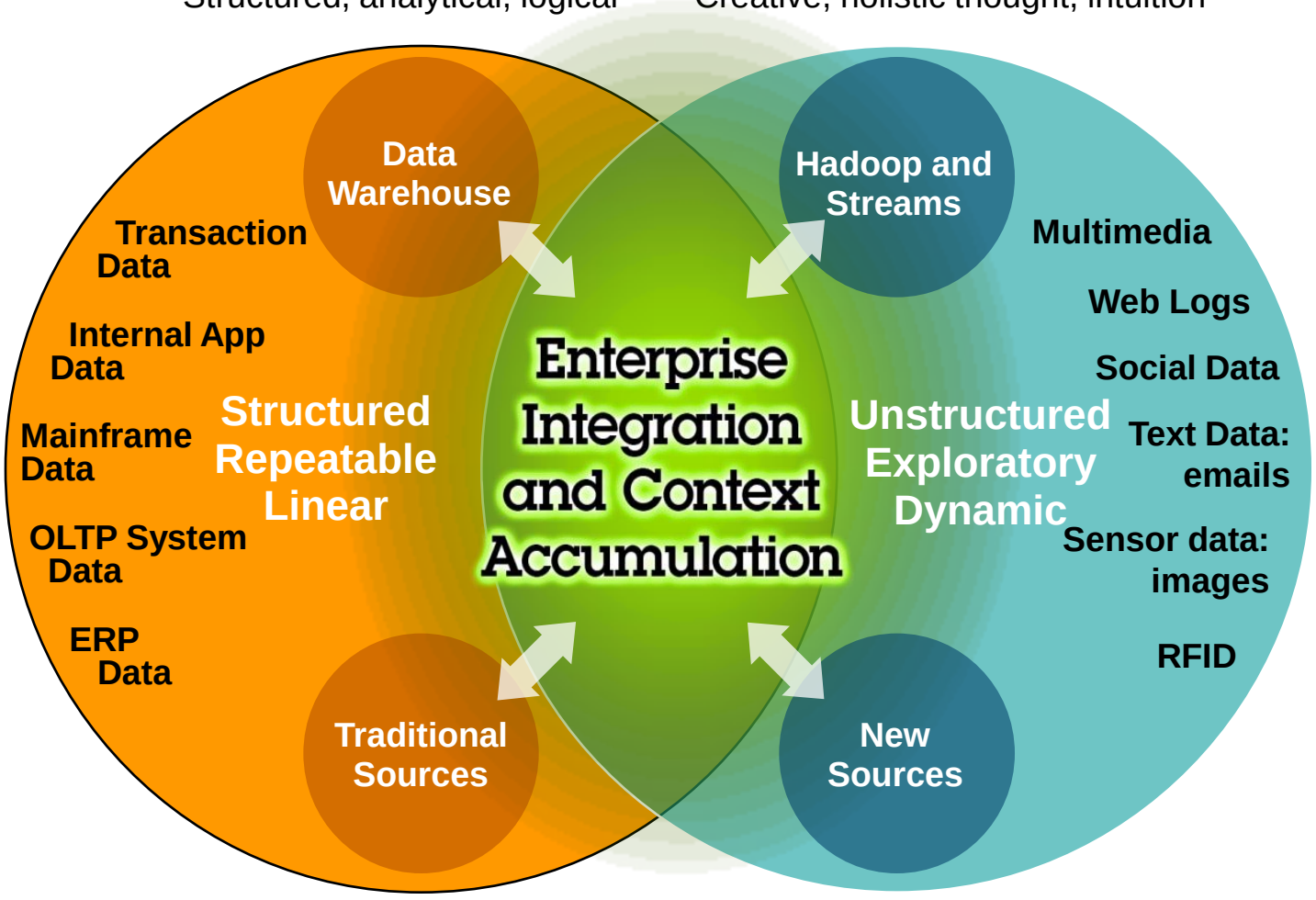

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Mainframe Strategy

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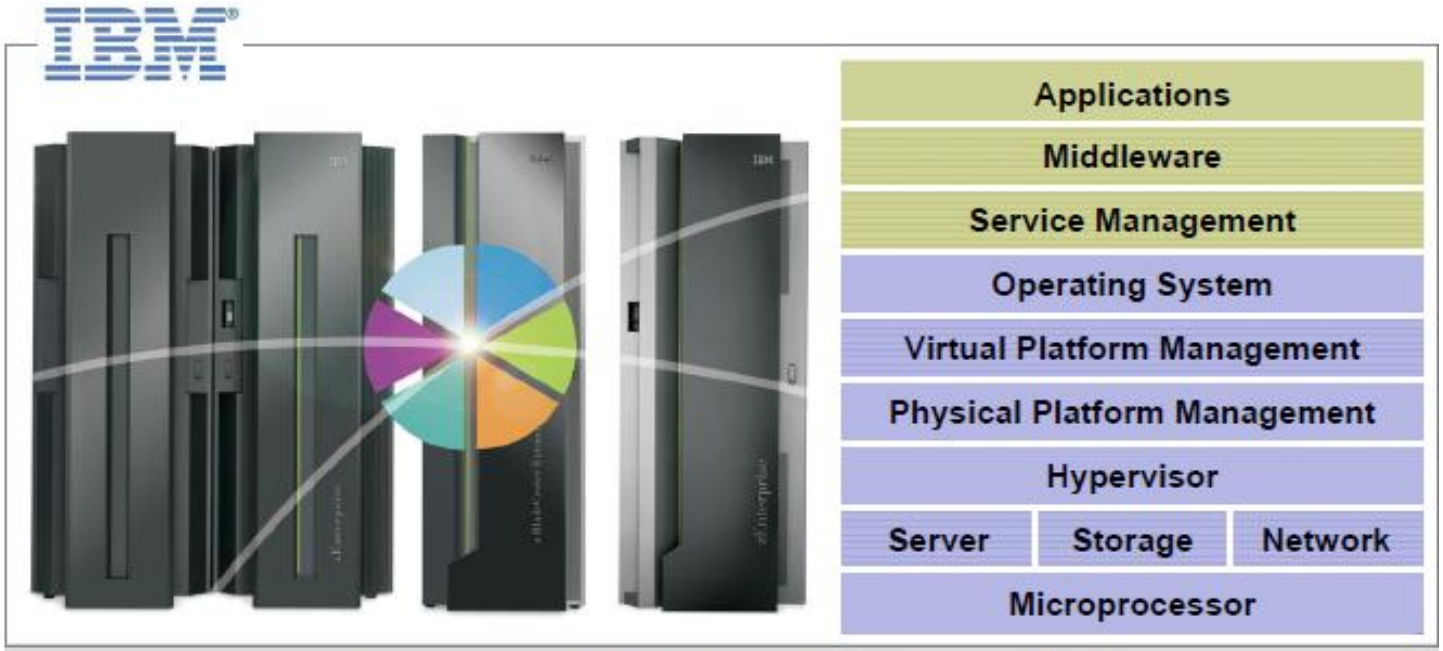
Innovation, integration and optimization at every level



Focused, collaborative innovation
A "complete systems" approach
Intelligent performance

DB2 Analytics Accelerator for z/OS

Netezza appliance connected to System z only accessible through DB2

Blending System z and Netezza technologies to deliver unparalleled, mixed workload performance for complex analytic business needs.

What is the value?

- Fast, predictable response times for “right-time” analysis
- Accelerate analytic query response times
- Improve price/performance for analytic workloads
- Minimize the need to create data marts for performance
- Highly secure environment for sensitive data analysis
- Transparent to the application and user

Large Insurance Company – Business Reporting

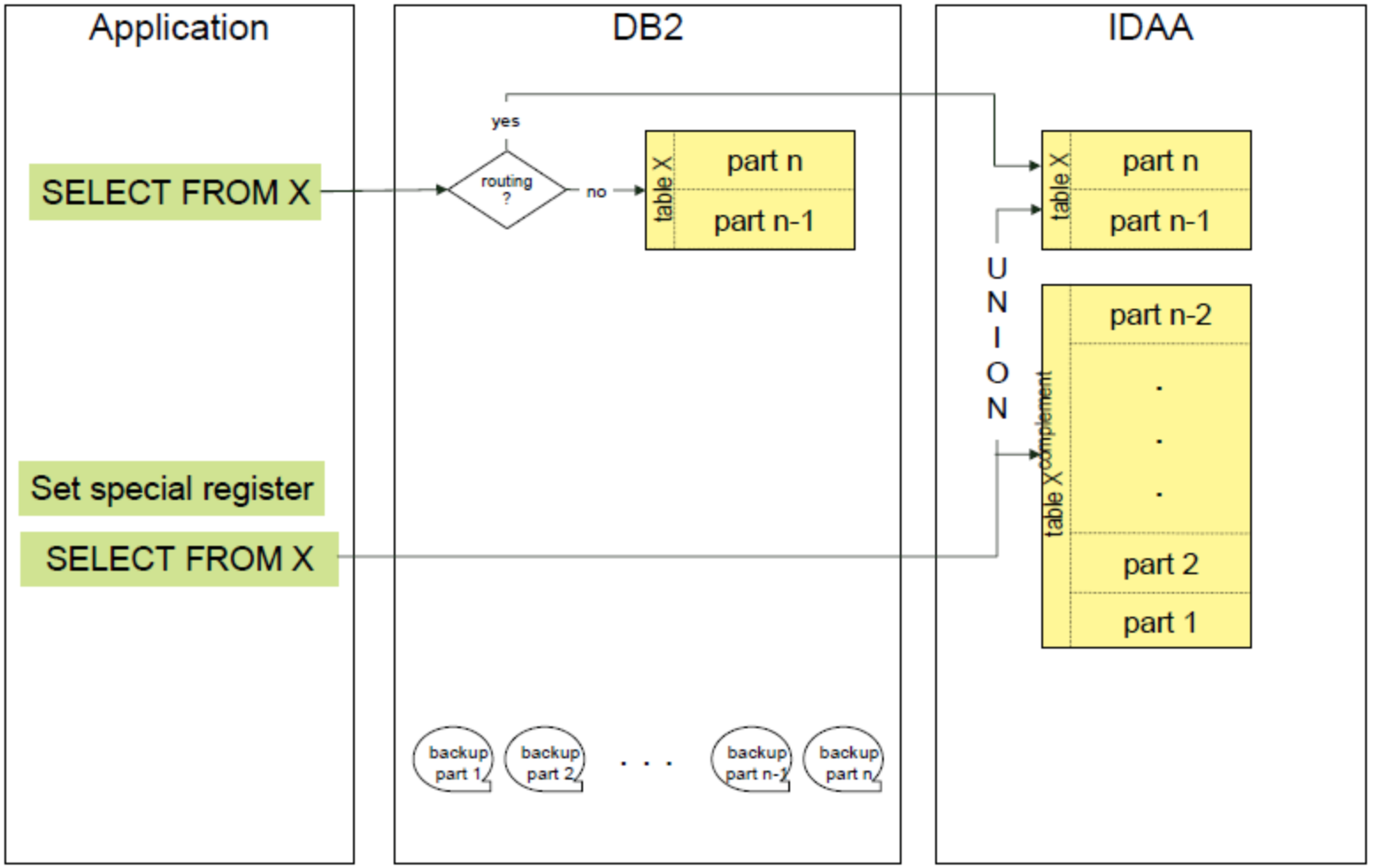
"we had this up and running in days with queries that ran over 1000 times faster"

			DB2 Only		DB2 with IDAA		Times Faster
Query	Total Rows Reviewed	Total Rows Returned	Hours	Sec(s)	Hours	Sec(s)	
Query 1	2,813,571	853,320	2:39	9,540	0.0	5	1,908
Query 2	2,813,571	585,780	2:16	8,220	0.0	5	1,644
Query 3	8,260,214	274	1:16	4,560	0.0	6	760
Query 4	2,813,571	601,197	1:08	4,080	0.0	5	816
Query 5	3,422,765	508	0:57	4,080	0.0	70	58
Query 6	4,290,648	165	0:53	3,180	0.0	6	530
Query 7	361,521	58,236	0:51	3,120	0.0	4	780
Query 8	3,425.29	724	0:44	2,640	0.0	2	1,320
Query 9	4,130,107	137	0:42	2,520	0.1	193	13

- DB2 Analytics Accelerator (Netezza 1000-12)
  - Production ready - 1 person, 2 days
  - Choose a Table for "Acceleration"
- Table Acceleration Setup in 2 Hours
  - DB2 "Add Accelerator
  - Choose a Table for "Acceleration"
  - Load the Table (DB2 Loads Data to the Accelerator
  - Knowledge Transfer
  - Query Comparisons
- Initial Load Performance
  - 400 GB Loaded in 29 Minutes
  - 570 Million Rows
  - Loaded 800 GB to 1.3 TB per hour
- Extreme Query Acceleration - 1908x faster
  - 2 Hours 39 minutes to 5 Seconds
- CPU Utilization Reduction to 35%

IDAA - High Performance Storage Saver (HPSS)

Applications have transparent access (no SQL statement changes needed) to the Table



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Oracle Takeout Strategy

DB2 101

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- IBM DB2 Advanced Enterprise Edition is as low as 1/3rd the price[1] of Oracle
- DB2 on POWER is as 3X faster per core[2] than Oracle Database on SPARC
- Breakthrough migration technology delivers up to 98% compatibility[3] with Oracle PL/SQL

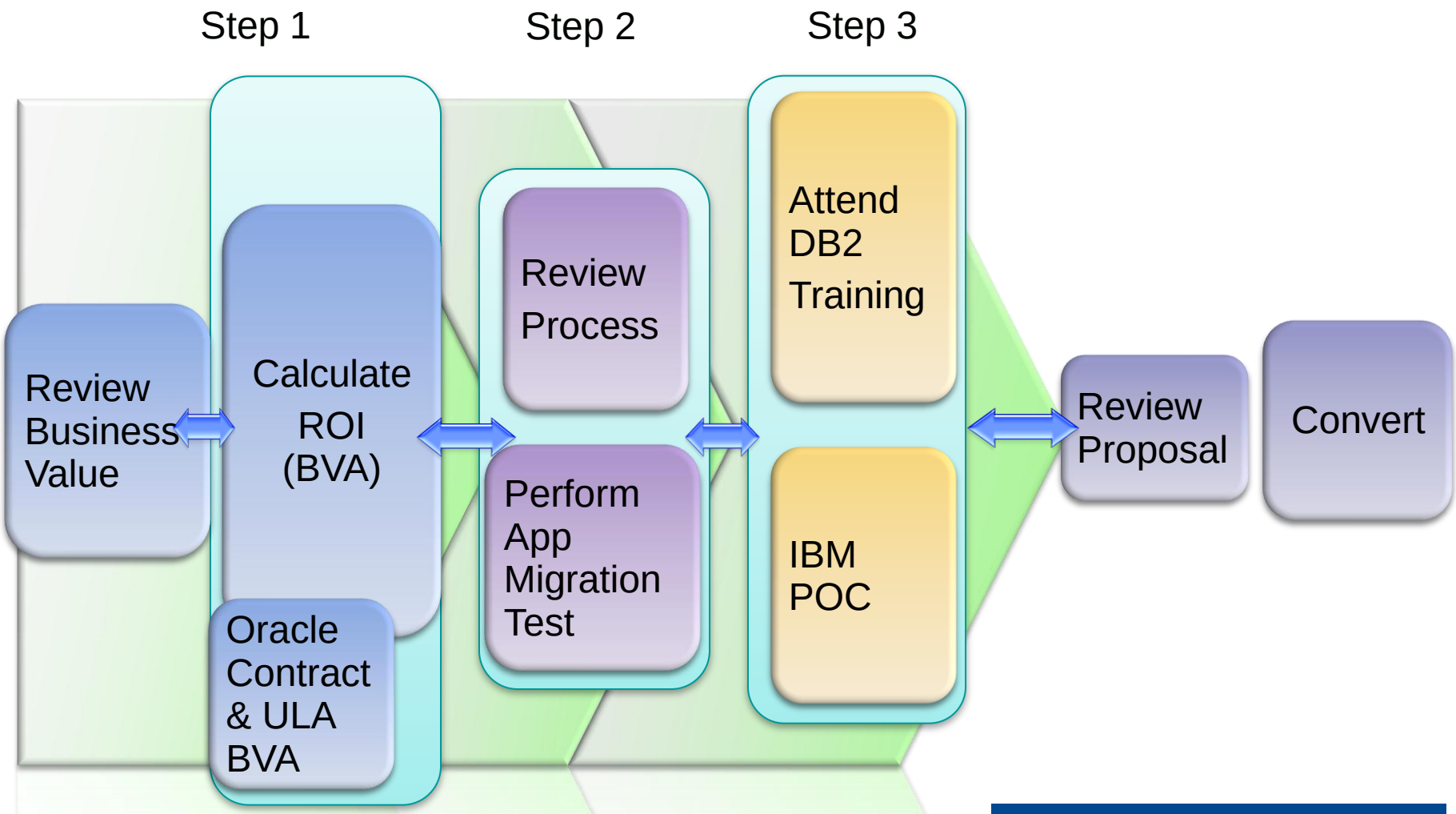
1. **PRICE** based on price per core of comparable hardware and publicly avail U.S. info on 11/11/2011 for IBM DB2 Advanced Enterprise Edition + Oracle software w/comparable capabilities. Price comparison is NOT based on the specific benchmarks listed here. IBM: 100 Processor Value Units. Oracle: assumes 1.0 processor multiplier. Both incl. Y1 maint/support.
2. **PERFORMANCE**: www.tpc.org (http://www.tpc.org) as of 11/11/11 [IBM Power 780 (3 x 64 C)(24 Ch/192 C/768 Th); 10,366,254 tpmC; $1.38/tpmC; avail 10/13/10 v. Oracle SPARC SuperCluster w/T3-4 Servers (27 x 64 C)(108 Ch/1728 C/13824 Th); 30,249,688 tpmC; $1.01/tpmC; avail 6/1/11]. TPC-C is a trademark of Transaction Performance Processing Council. www.sap.com/solutions/benchmark/ (http://www.sap.com/solutions/benchmark/) as of 11/11/11 [IBM Power 795 (32 P/256 C/1024 Th); 126063 users/2-tier SAP ERP 6.0 pack4/AIX 7.1 + DB2 9.7; cert 2010046 v. Oracle SPARC Enterprise Server M9000 (64 P/256 C/512 Th); 39100 users/2-tier SAP ERP 6.0/Solaris 10, Oracle 10g; cert 2008042]. SAP is registered trademark of SAP AG in Germany and in several other countries.
3. **COMPATIBILITY**: Based on internal tests and reported client experience from June 30, 2010 through July 20, 2011.

Business Value Assessment Tool

Calculate your savings with DB2

- The tool uses a simple graphical interface - enter a few key inputs and assumptions.
- Assumptions can be modified if inputs change.
- Cost categories show detailed calculations.
- Talk to your IBM Rep or The Fillmore Group to run an assessment.

Migration – Discovery to Implementation



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IBM Database Facts:

- Has more patents than Oracle and SQL Server combined
- Over 1300 Core Database developers located in 5 main development laboratories around the world.
- Over 300 researchers located in labs in the United State, Canada, Japan and Israel are currently working on advancement in database technologies for IBM. Examples of past research projects which have developed into product include : database compression, heterogeneous replication, advancements in query optimization for optimal performance, high availability , pureScale and cubing engines. All of these are best of breed in the marketplace.
- 25 of the top 25 banks
- 9 of the top 10 insurance providers
- 23 of the top 25 U.S. retailers
- Migrated over 100 customers from SAP / Oracle to SAP / DB2 in last 2 years
- Over 700 customers have made the SAP / DB2 decision

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DB2 101 Summary

DB2 101

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Our next event

- Mid-Atlantic IM Virtual Users Group
  - http://www.thefillmoregroup.com/virtual-user-groups/mid-atlantic-im-vug/
- "IBM Data Management Announcements - What You Should Know"
  - https://www2.gotomeeting.com/register/387815986
  - Tuesday, May 7, 2013; 11:00 AM - 12:00 PM EDT
  - Kim May, The Fillmore Group
  - Warren Heising, IBM

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Resources

- The Fillmore Group's blog
  - http://www.thefillmoregroup.com/blog
- Kim May
  - kim.may@thefillmoregroup.com
  - http://twitter.com/KimMayTFG
- Frank Fillmore
  - frank.fillmore@thefillmoregroup.com
  - http://twitter.com/ffillmorejr
  - http://tinyurl.com/ChannelDB2
  - Flipboard for iPad, iPhone, Android: "BigData"

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