

IBM's Information Management

On Linux for System z

Frank Heimes

Senior IT Architect - IBM SWG LIC



Agenda

- Information Management – An end-to-end view

- Going into details:

- IBM DB2 LUW

Data Management, (E)DM

- IBM Optim

- IBM InfoSphere Warehouse

- IBM InfoSphere Information Server

Information Management, (E)IM

- IBM InfoSphere Master Data Management

- IBM Cognos

Business Optimization, BO

- IBM SPSS

Information On Demand – Information Management End-to-End

Unlocking the Business Value of Information for Competitive Advantage

Customer & Product Profitability Financial Risk Insight Workforce Optimization Dynamic Supply Chain Multi-Channel Marketing

Business Optimization

Better Business Outcomes

End-to-End Capabilities



Plan, understand and optimize business performance



Establish, Govern, and Deliver Trusted Information

Flexible Architecture for Leveraging Existing Investments

Optimize content-based Operational & Compliance Processes



Manage data / content over its lifetime

Information On Demand – Information Management End-to-End

Unlocking the Business Value of Information for Competitive Advantage

Customer & Product Profitability Financial Risk Insight Workforce Optimization Dynamic Supply Chain Multi-Channel Marketing

Business Optimization

Better Business Outcomes

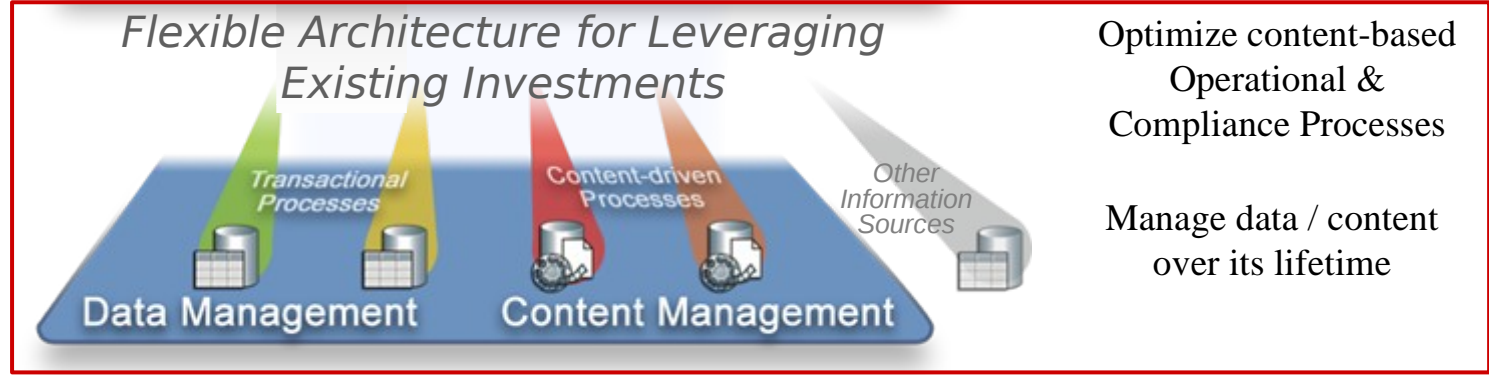
End-to-End Capabilities



Plan, understand and optimize business performance



Establish, Govern, and Deliver Trusted Information



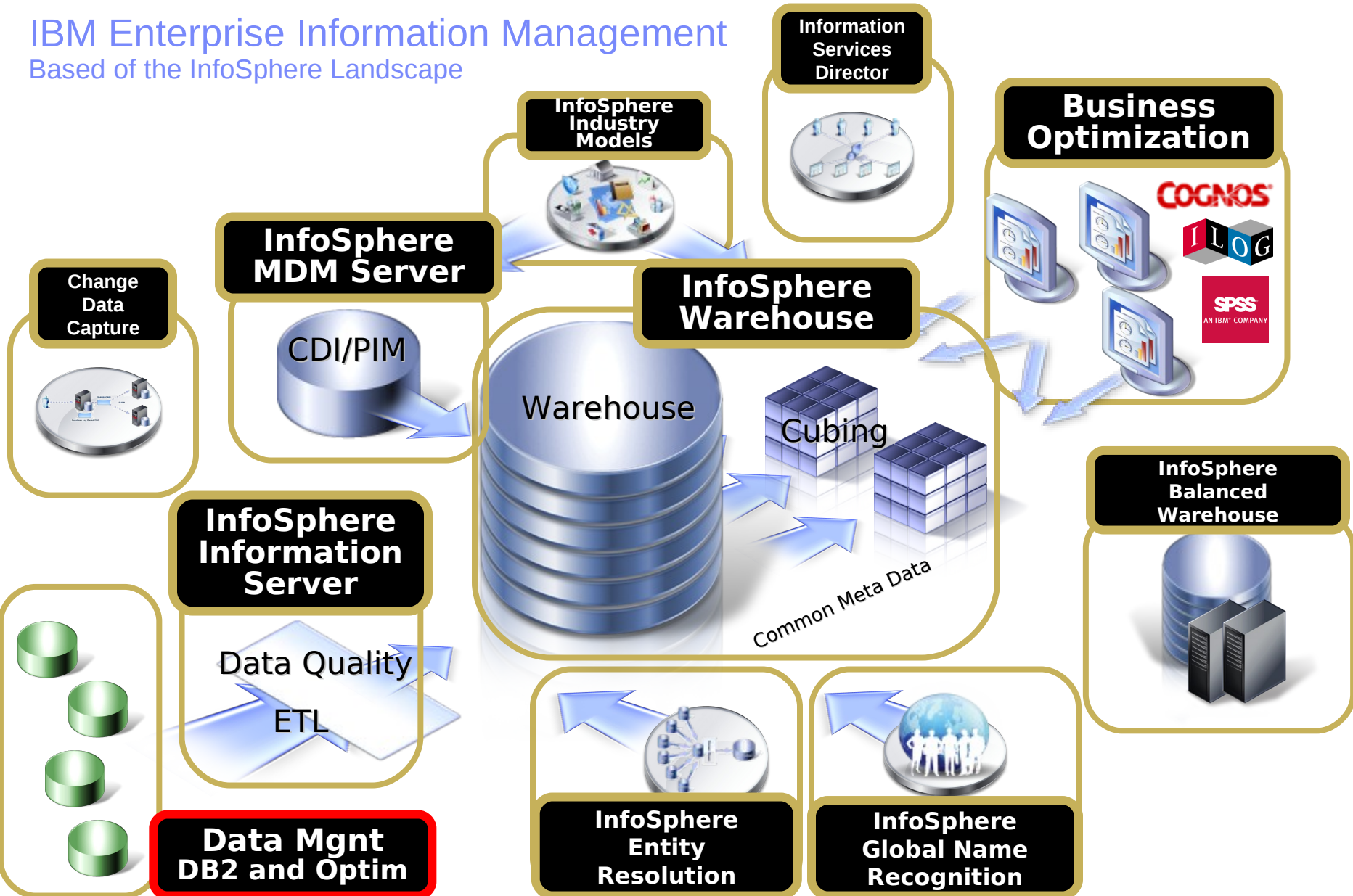
Optimize content-based Operational & Compliance Processes

Manage data / content over its lifetime



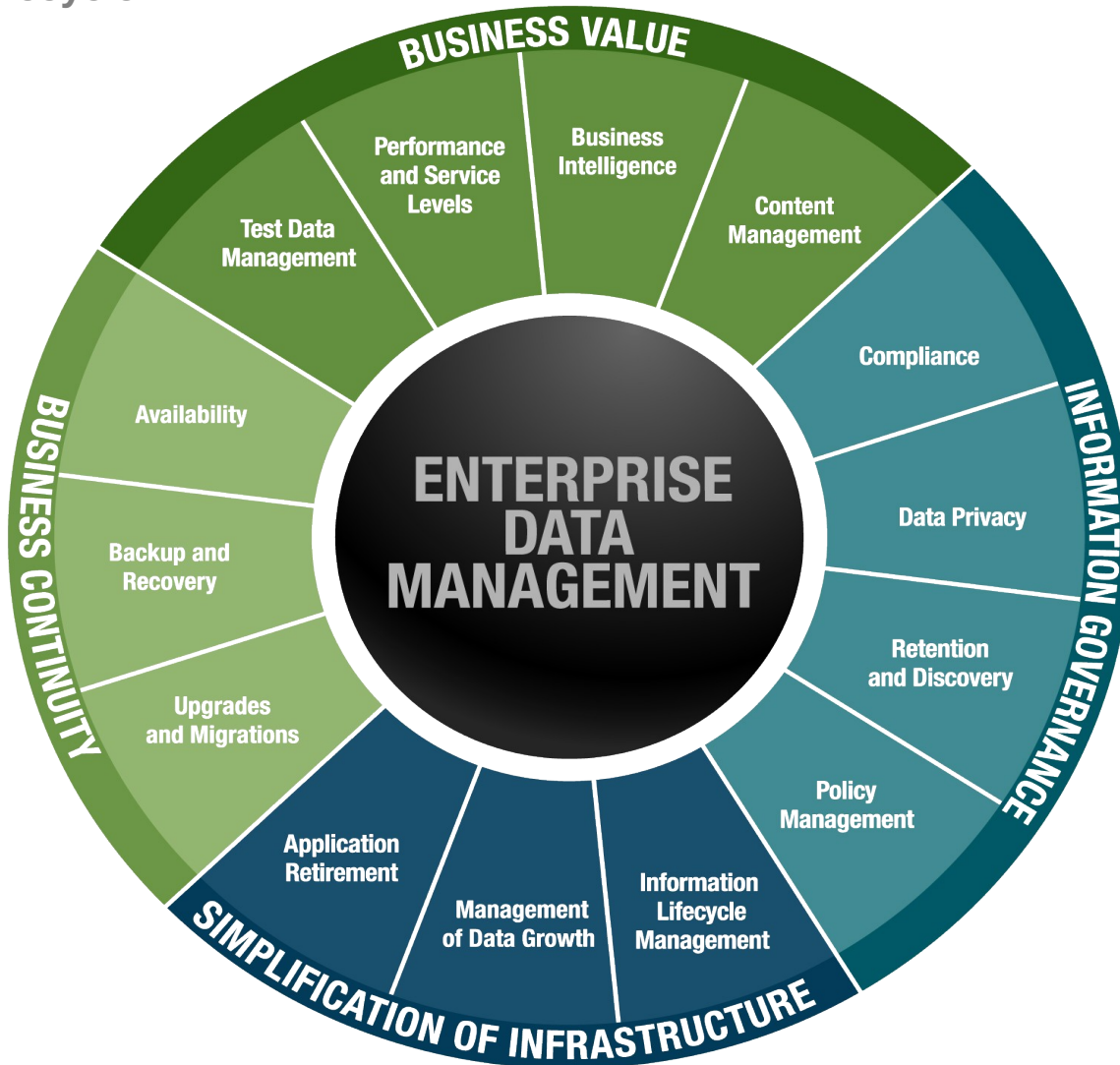
IBM Enterprise Information Management

Based of the InfoSphere Landscape



What is Enterprise Data Management?

Processes and technology for managing mission critical application data throughout its lifecycle.



The 3 Tenets of DB2 LUW



Lowest TCO

Unparalleled Automation
Deep Compression
Lightning Fast

Simple to Run

Flexible Deployment
Industry leading XML support
Self Managing

Most Reliable

World class audit and security
Easy High Availability
Workload Management

<http://www.ibm.com/software/data/db2/linux-unix-windows/>



The following DB2 9.7 Enterprise Server Edition Utilities are Available for Linux on System z

■ Standard options:

- Backup compression, Connection Concentrator, *DB2 Governor*, HADR, Homogeneous Federation, Homogeneous SQL Replication, MQT, MDC, Net Search Extender, Online reorganization, pureXML storage, Query parallelism, Spatial Extender, TSAMP, *support for alternate vendor SQL*

■ Licensed options:

- DB2 Geodetic Data Management feature
- IBM Homogeneous Replication Feature for DB2 Enterprise Server Edition (Q rep.)
- DB2 Advanced Access Control feature (LBAC)
- *DB2 Storage Optimization feature (Deep Compression)*
(on rows, values, XML, indexes, temporary tables and backup level)
- *IBM DB2 Performance Optimization Feature for Enterprise Server Edition*
 - *Optim Performance Manager (Performance Expert)*
 - *Query Patroller*
 - *Workload Management*

■ Other:

- Data Partitioning Feature (DPF) is provided with InfoSphere Warehouse editions
- DB2 Connect for Linux on System z editions are available



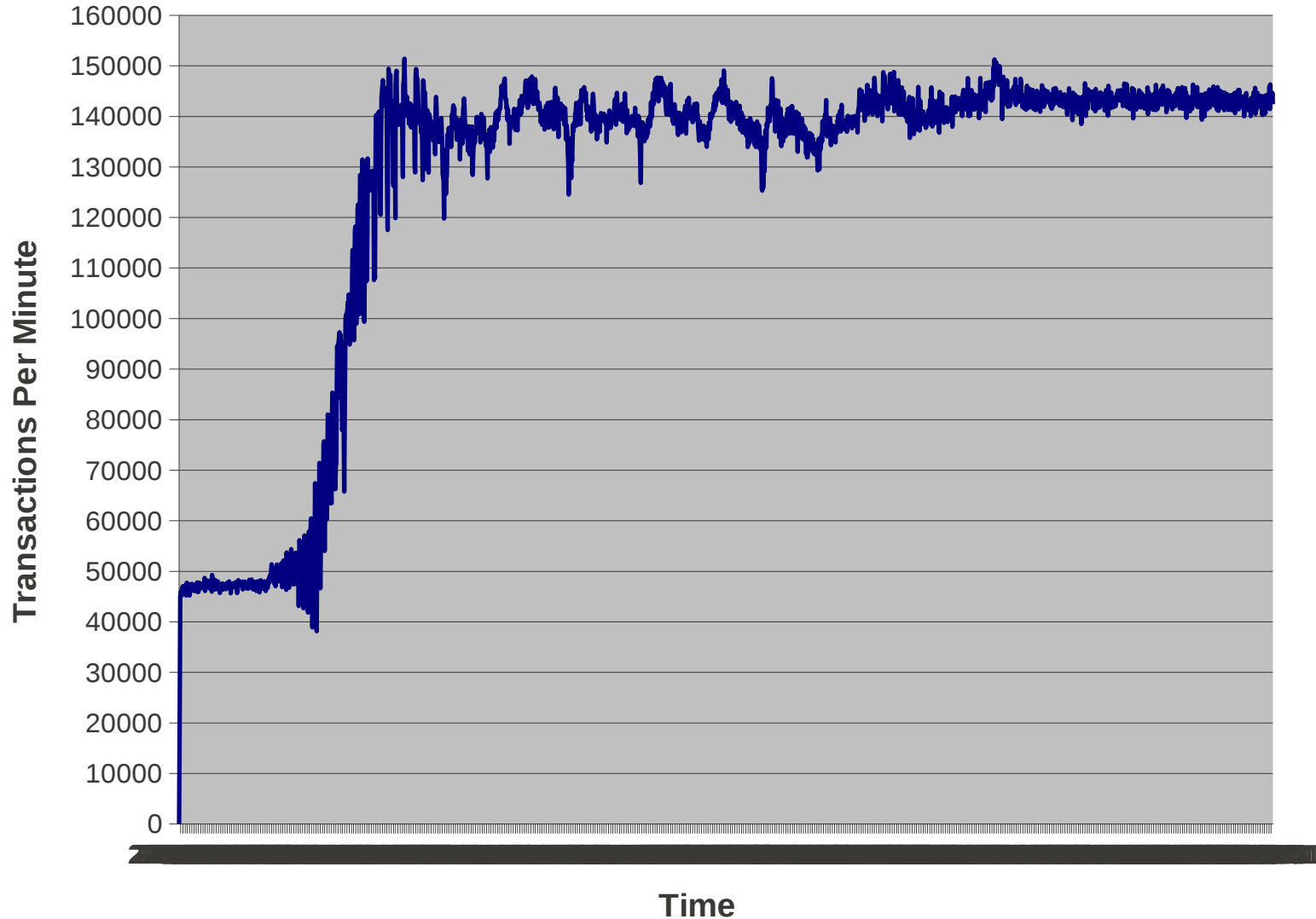
DB2's Built-In Autonomics Reduce DBA Effort

- **These key autonomic features reduce DBA effort.**
 - Self-Tuning Memory Manager (STMM)
 - Policy-based maintenance
 - Utility and application throttling
 - Log archiving
 - Automatic storage
 - Automated statistics collection and sampling

- **Let DB2 automatically react to changes in the workload.**
 - DB2 adapts to changing workloads.



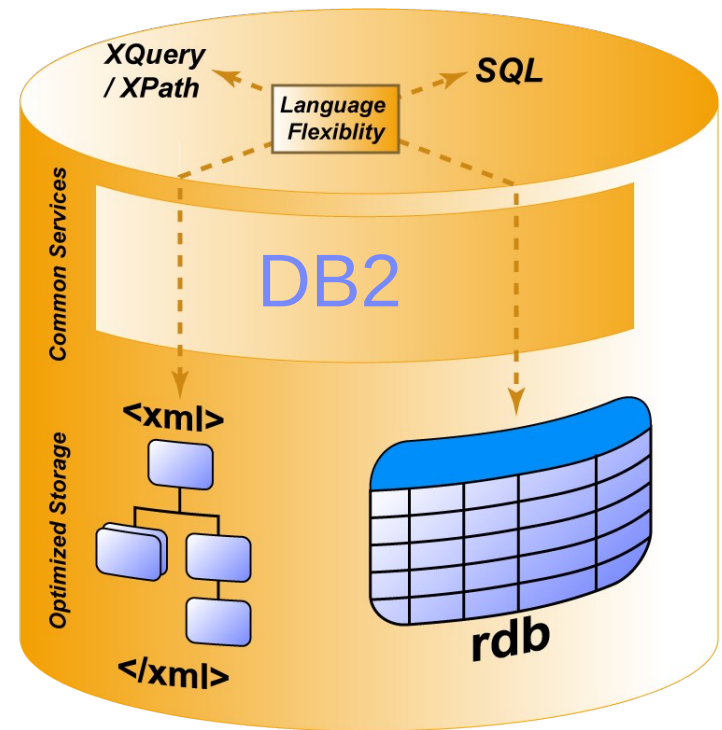
DB2 STMM Monitors And Tunes A Broad Range Of Key Memory Objects For The DBA



DB2 Provides Leading Transactional Performance For XML



- **Easy development and integration**
 - No complex mapping to relational schemas
 - No parsing upon retrieval
- **Efficient storage**
 - Only 440GB of storage for 1TB XML benchmark
- **Untouchable performance**
 - 6,763 transactions per second for 1TB XML benchmark
- **Part of the DB2 Engine**
 - No extra cost





DB2 Row Compression Is Quite Powerful

■ Dictionary contains repeated strings

– Strings can be across columns or within columns

RCLNT	GL_SIRID	RLDNR	RRCTY	RVERS	RYEAR	RTCUR	RUNIT	DRCRK	POPER	DOCCT	DOCNR	DOCLN	RBUKRS	RPRC	BWART	BLART
800	4751	8A	0	0	1995	DEM		S		1A	21	1	1000		1402	
800	4752	8A	0	0	1995	DEM		S		1A	21	2	1000		1402	
800	4753	8A	0	0	1995	DEM		S		1A	21	3	1000		1402	
800	4754	8A	0	0	1995	DEM		S		1A	22	1	1000		1402	
800	4755	8A	0	0	1995	DEM		S		1A	22	2	1000		1402	

Compression dictionary

x'01C	8A,0,0,1995,DEM,,S,1,A
F'67t	1000,1402
-	-

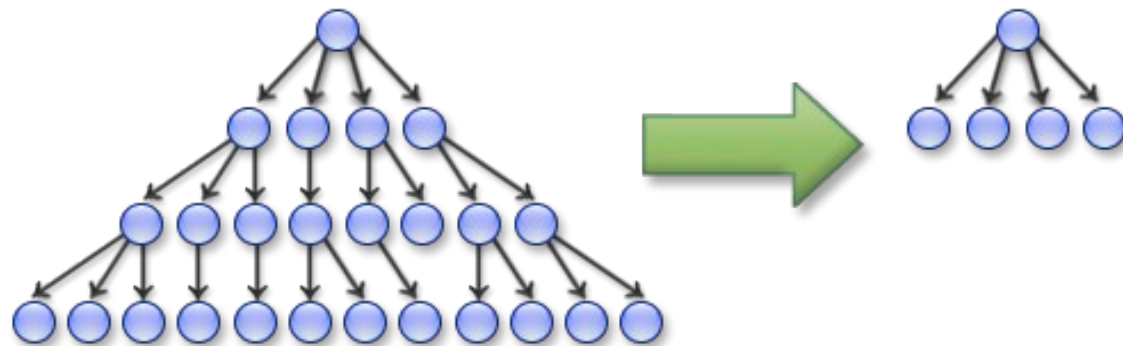
Common sequences of consecutive bytes in row replaced with symbol

800	4751	x'01C	21	1F'67t	0	
800	4752	x'01C	21	2F'67t	0	
800	4753	x'01C	21	3F'67t	0	
800	4754	x'01C	22	1F'67t	0	
800	4755	x'01C	22	2F'67t	0	

■ Real SAP table with 102 columns

Indexes And Temporary Tables Can Be Compressed In DB2 9.7

- **Multiple algorithms for automatic index compression**



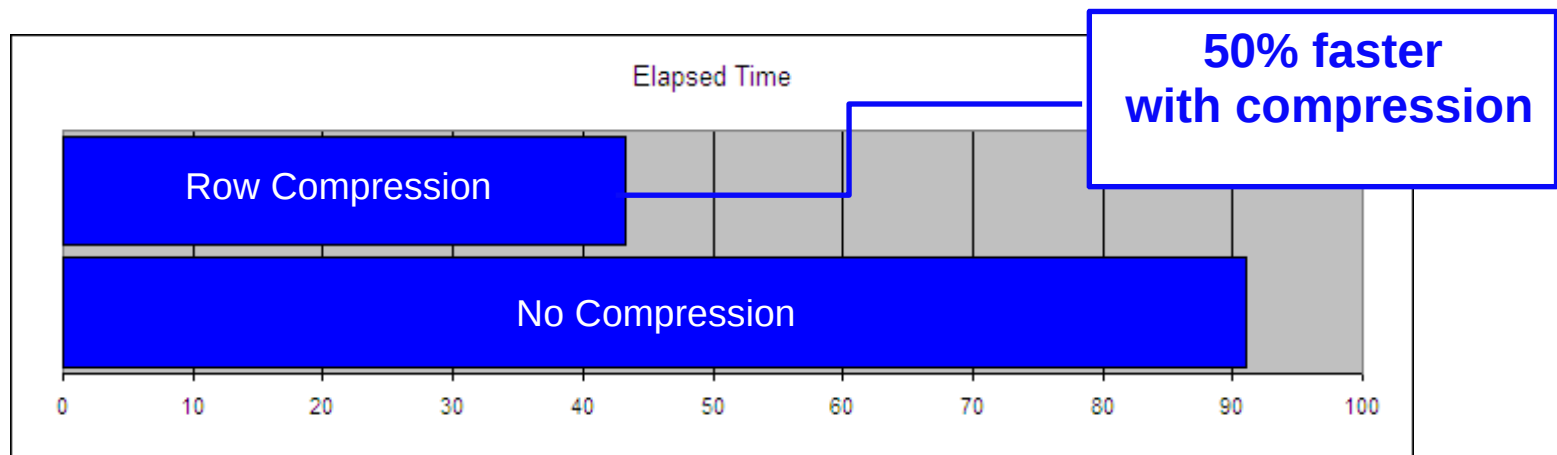
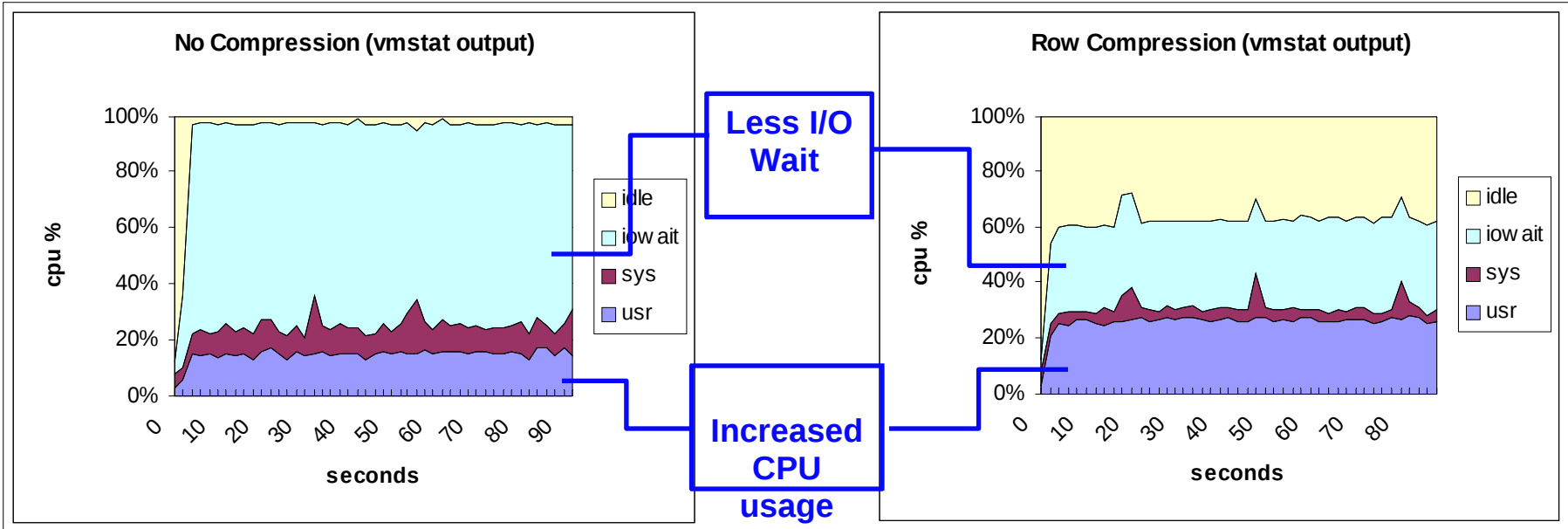
- **Automatic compression for temporary tables**



- **DB2 Storage Optimization Feature (Deep Compression)**
now for **rows, values, XML, indexes, temporary tables and backup**

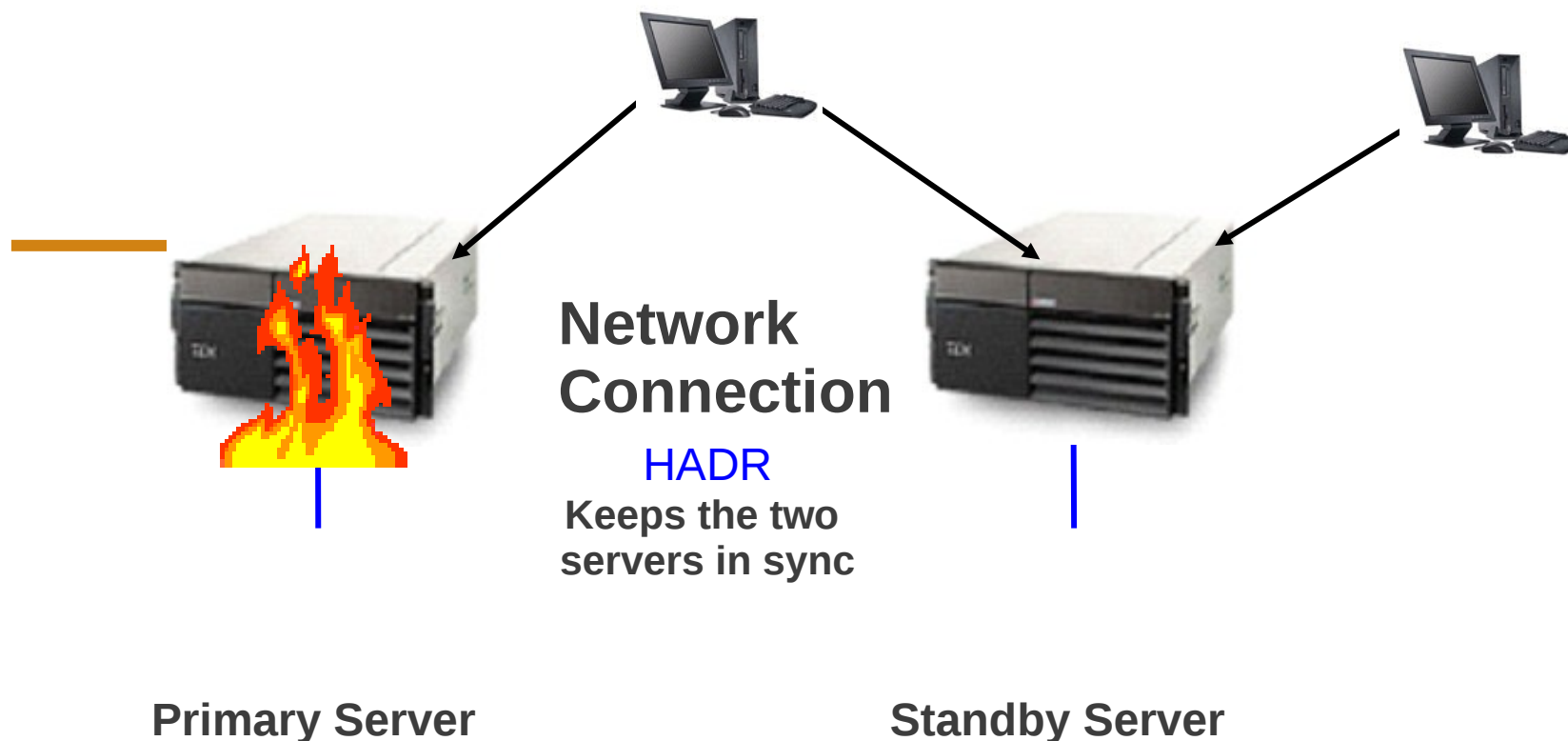
http://www.ibm.com/software/data/db2/linux-unix-windows/editions_features_storage.html

Data Compression Provides Performance Benefits

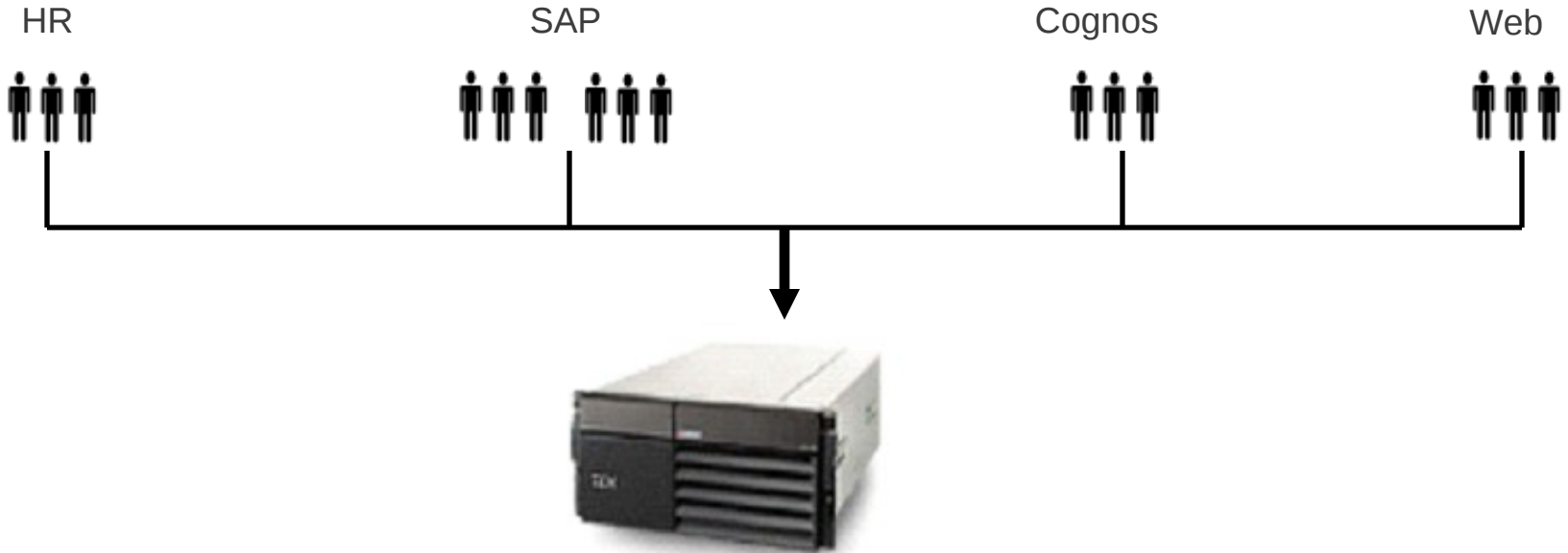


DB2 Delivers Fast Failover

- Turn your disaster recovery hardware from seldom used servers to a reporting server giving you more insight
- During failover, DB2 seamlessly turns the **read only standby** into a **read/write server**



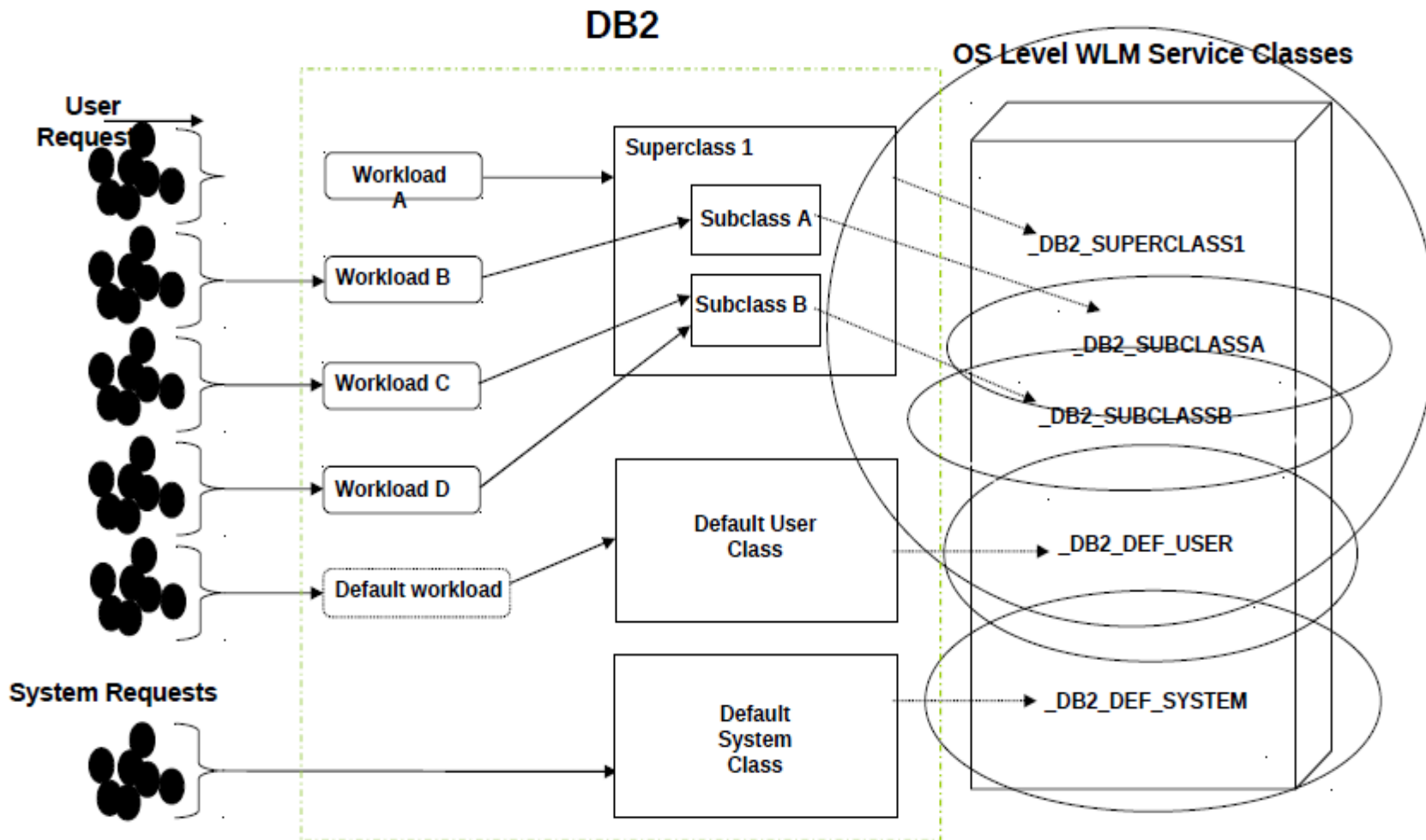
DB2's Workload Management Is Powerful And Flexible



- Give appropriate level of resources to different users and applications to meet their SLAs
- Ensure different users/apps do not monopolize resources
- Limit resources available to specific applications
- Increase priority of users/apps at set times and/or dates
- Very flexible



Workload Management – End To End





DB2 Supports alternate vendor SQL

■ **Before:**

- **Map schema and data types**
- **Move data**
- **Translate (semi-automated)**
 - Triggers
 - Procedures
 - Functions
 - Anonymous blocks
- **Translate SQL (manual)**
- **Debugging**
- **Tuning**
- **Parallel production**
- **Cut over**

■ **After:**

- **Import schema and data types**
- **Move data**
- **Runs natively**
- **Handle exceptions**
- **Debugging**
- **DB2 auto tunes**
- **Parallel production**
- **Cut over**

*Now takes days
instead of months!*

DB2 Offers A Standards Based Development Environment



■ Easy application development and deployment

- Support for the latest languages and versions
- Support for the latest environments, including Visual Studio 2008, Eclipse, and pureQuery
- Support for multiple SQL dialects and procedural languages
- Accelerate development of custom and built-in packages

■ Easy Web services

■ Choice of query languages and APIs

- SQL, XQuery, XPath, CLPPlus, JDBC, SQLJ, ODBC, ADO, .NET, CLI, OLE-DB, and more



Borland^{USA}



Rational. software



WebSphere. software

Data Management Challenges Today



- **Mitigate Risk**

- Effectively and securely manage archived data
- Protect data privacy
- Accurate, prompt responses to auditing requests

- **Maintain Performance in face of Data Growth**

- Improve application performance by moving historical transaction records to a safe, secure archive
- Achieve Service Level Agreements (SLAs) consistently

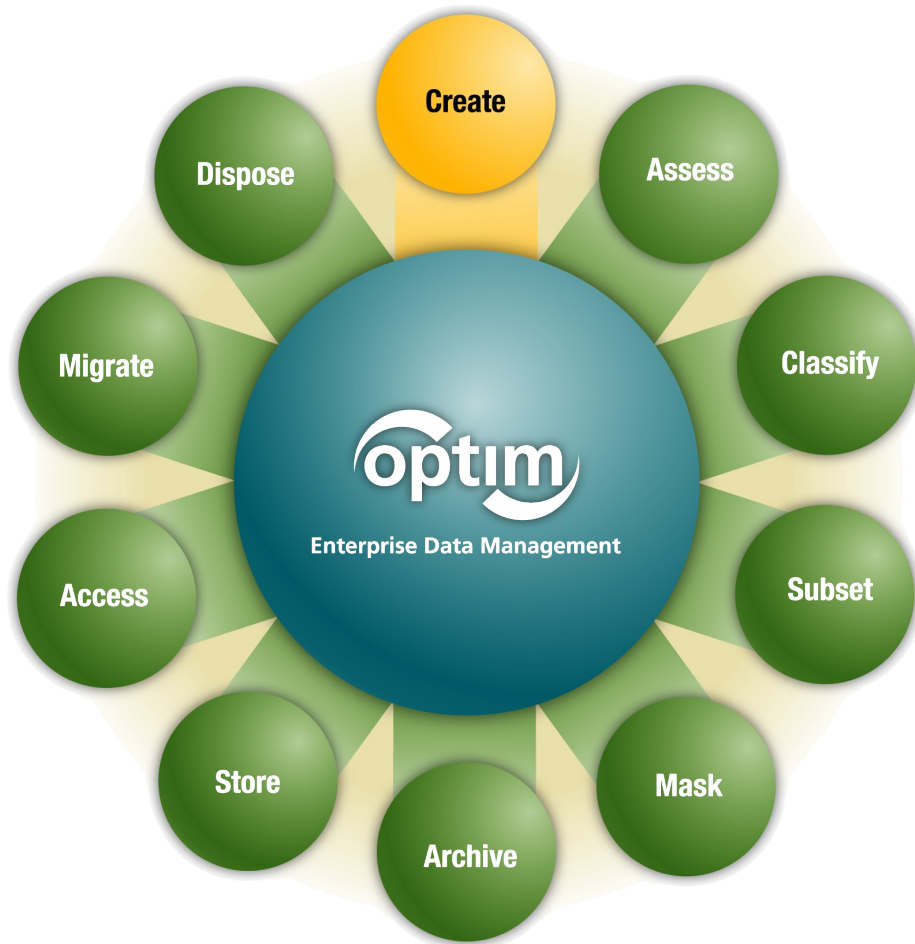
- **Control Costs**

- Reduce infrastructure costs; utilize cost effective tiered storage
- Minimize cost and time for compliance
- Improve productivity



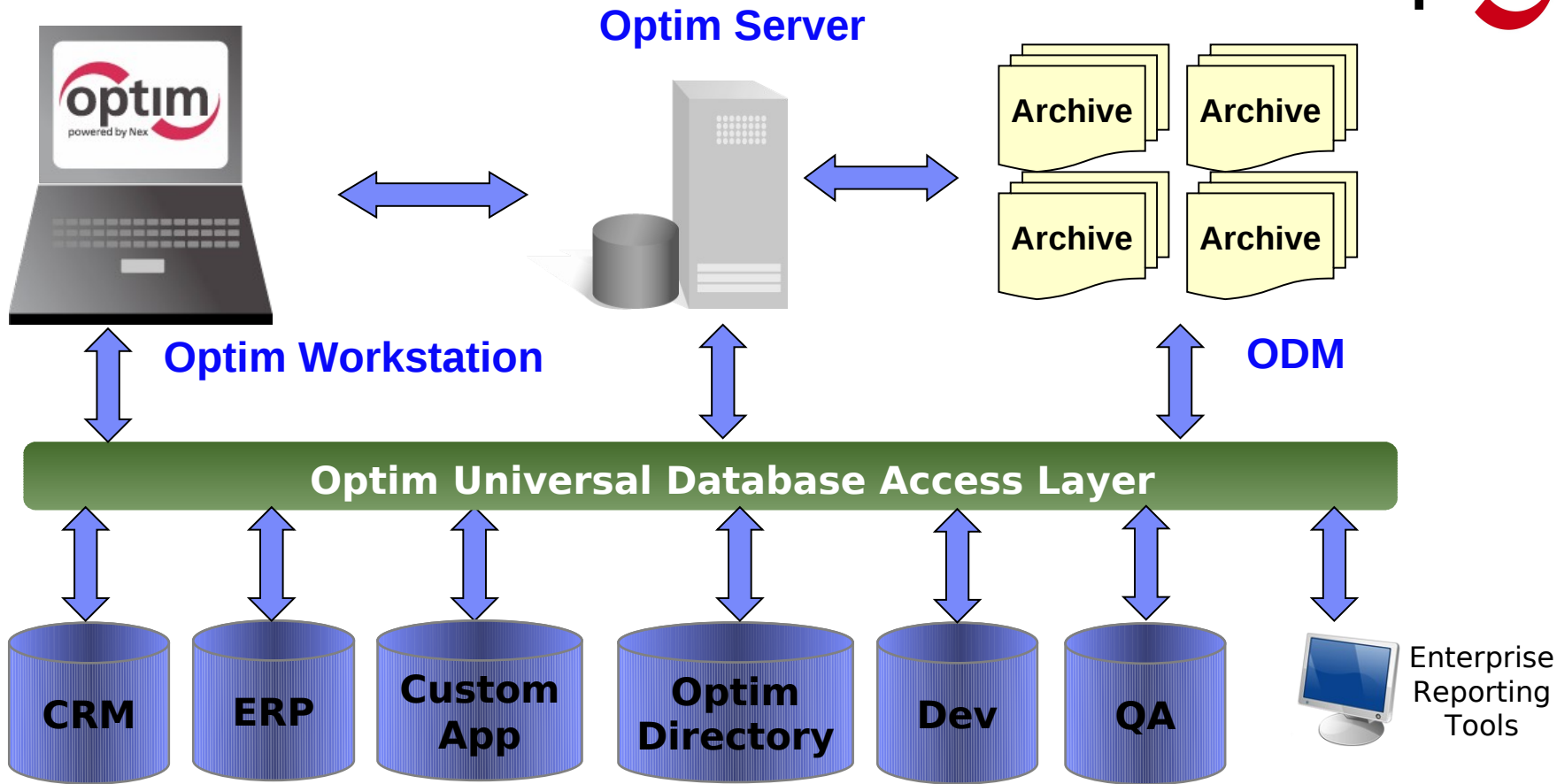
IBM Optim – Integrated Data Management

IBM Optim Integrated Data Management solutions manage data from requirements to retirement. Boost performance, empower collaboration, and improve governance across applications, databases and platforms.



- Create via the application and Optim
- Assess applications and data
- Classify data on its business value and access requirements
- Subset from production to non-production environments
- Intelligent masking to protect privacy
- Separate seldom used historical transactions from current data
- Store Anywhere
- Access data any way!
 - Native Application Access
 - Application Independent Access
- Migrate data between environments, applications and databases
- Enforce disposal policies
 - Prevent information assets from becoming information liabilities

IBM Optim Architecture



Optim Workstation - Optim installed on a Windows PC capable of performing all Optim functions directly against a data source or by connecting to an Optim Server.

Optim Server - runs on a Unix or Windows server that handles requests from Optim WS or the cmd-line.

Open Data Manager (ODM) - Allows access to archive files as an ODBC data source (or archived tables).

IBM Optim – Integrated Data Management



Single, scalable, interoperable EDM solution provides a central point to deploy policies to extract, store, port, and protect application data records from creation to deletion.

Non Production Environments Subset & Mask



Production Environments Archive



**Data Growth, Data Privacy, Test Data Management,
Application Upgrades, Application Retirement**

Optim™



AIX Linux z/OS Windows XP/2000 Solaris HP/UX

NAS SAN ATA CAS Optical Tape

Information On Demand – Information Management End-to-End

Unlocking the Business Value of Information for Competitive Advantage

Customer & Product Profitability Financial Risk Insight Workforce Optimization Dynamic Supply Chain Multi-Channel Marketing

Business Optimization

Better Business Outcomes

End-to-End Capabilities

InfoSphere™ software



Plan, understand and optimize business performance



Establish, Govern, and Deliver Trusted Information

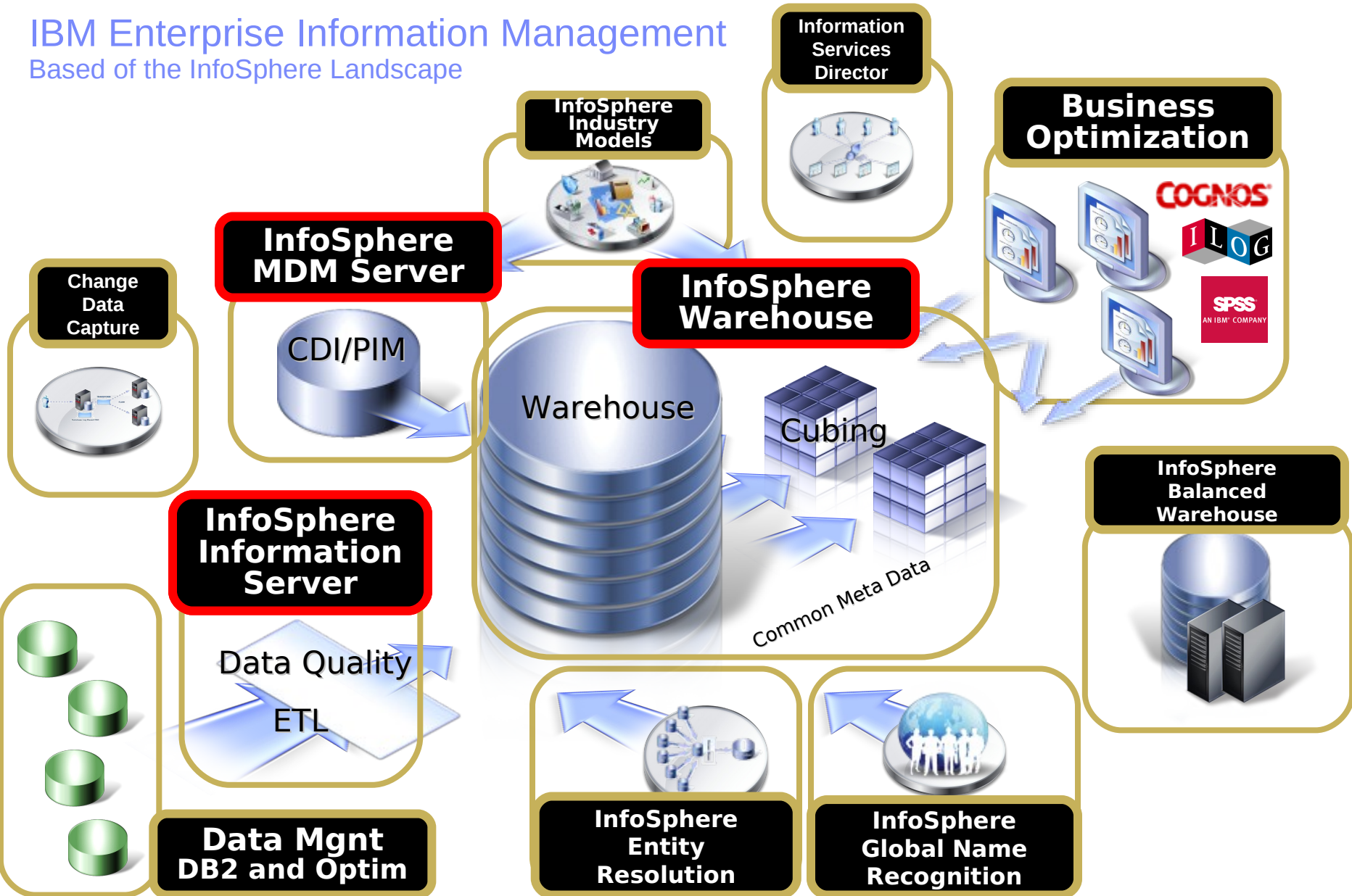
Optimize content-based Operational & Compliance Processes



Manage data / content over its lifetime

IBM Enterprise Information Management

Based of the InfoSphere Landscape



Trusted Information Management

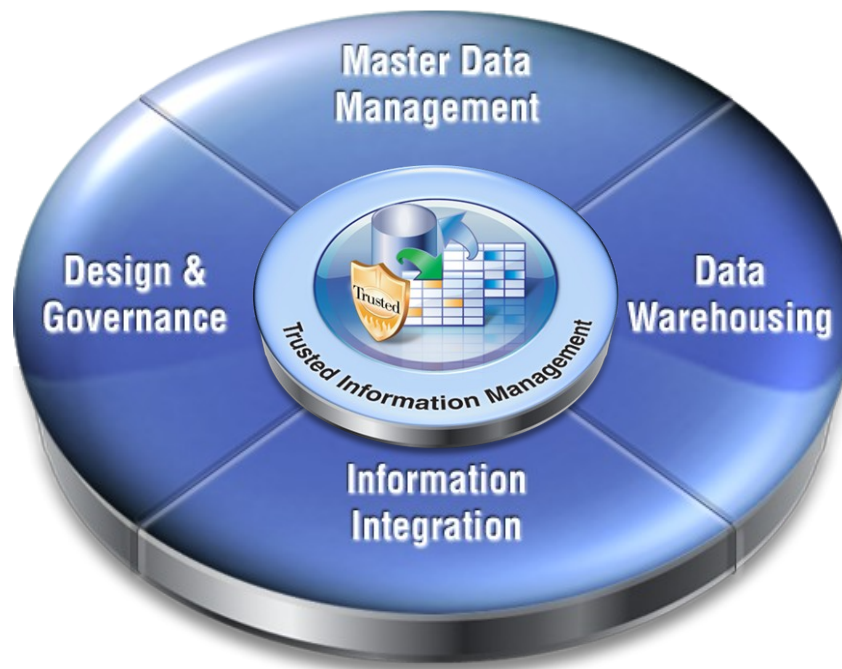
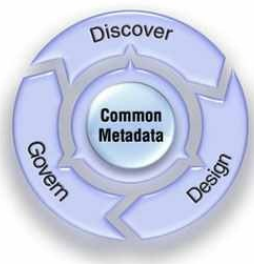
Create, manage, govern and deliver **trusted information**

Get A single view of your business

IBM InfoSphere MDM Server

Get your arms around your data

IBM InfoSphere Foundation Tools



Deliver better business intelligence faster

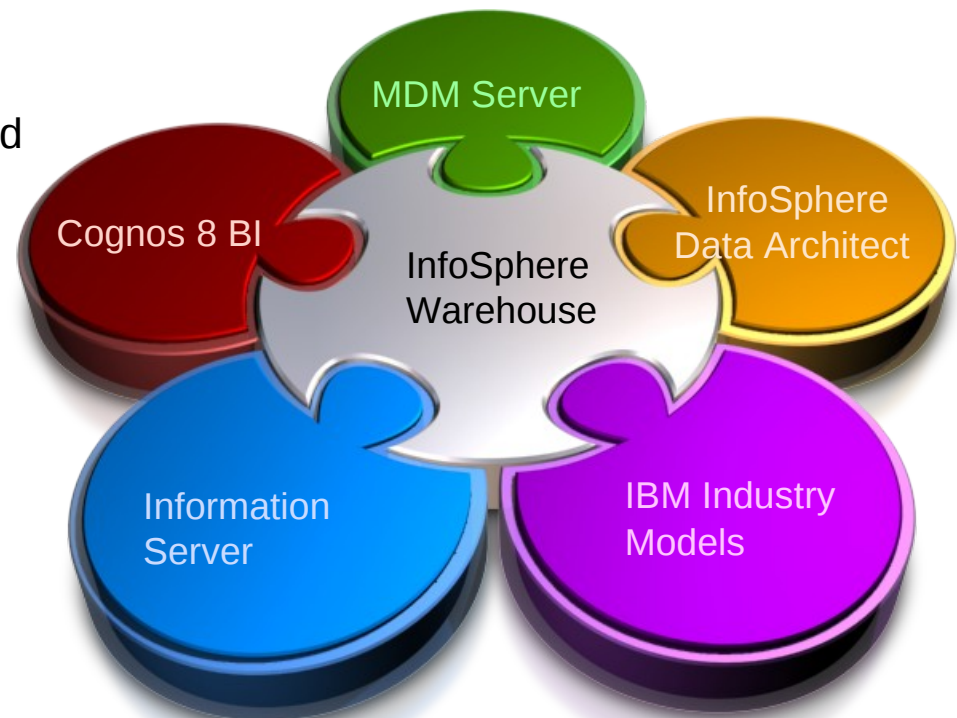
IBM InfoSphere Warehouse

Consolidate your application infrastructure

IBM InfoSphere Information Server

IBM InfoSphere Warehouse

- Adds core data warehouse and analytics capability to DB2
 - Advanced physical database modeling and design
 - in-database data movement and manipulation capabilities of SQL Warehouse Tool (SQW)
 - Optimize multidimensional reporting and analysis of data with Cubing Service
- Additional capabilities available as part of a broad System z Solution
 - Cognos 8 BI
 - InfoSphere Data Architect
 - Information Server
 - MDM Server
 - Industry Data Models



IBM InfoSphere Warehouse

InfoSphere Warehouse is the most comprehensive data warehouse solution in the industry; providing you with all of the capabilities necessary to glean maximum return from your most important investment - your information!

■ InfoSphere Warehouse

Provides a unified, powerful data warehouse delivering access to structured and unstructured information in real time.

■ Included components:

Cognos 8 BI Starter Edition: Best of breed, industry leading BI enables viewing of warehouse data immediately

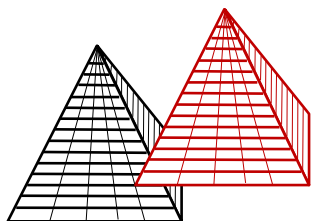
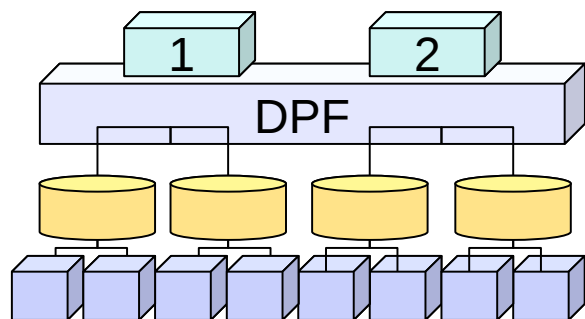
■ Add-on component(s):

- Advanced Access Control: Minimizes risk of unauthorized access
- Geodetic Data Management: Geographical location analysis
- Performance Optimization: Proactive management of system performance
- Storage Optimization: Reduce cost of storing data & improve system efficiency

■ DB2 Database Partitioning Feature users on Linux on System z must install it from:

- IBM InfoSphere Warehouse Base Edition
- IBM Base Warehouse Feature for DB2

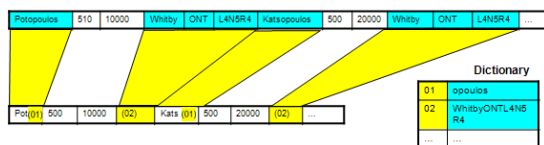
DB2 Features for Data Warehousing Solutions



- **Distribute** data across nodes (**DPF**)
- Range partition the rows in table partitions per node (**Range Partitioning**)
- Cluster the data by multidimensional column values (**MDC**)

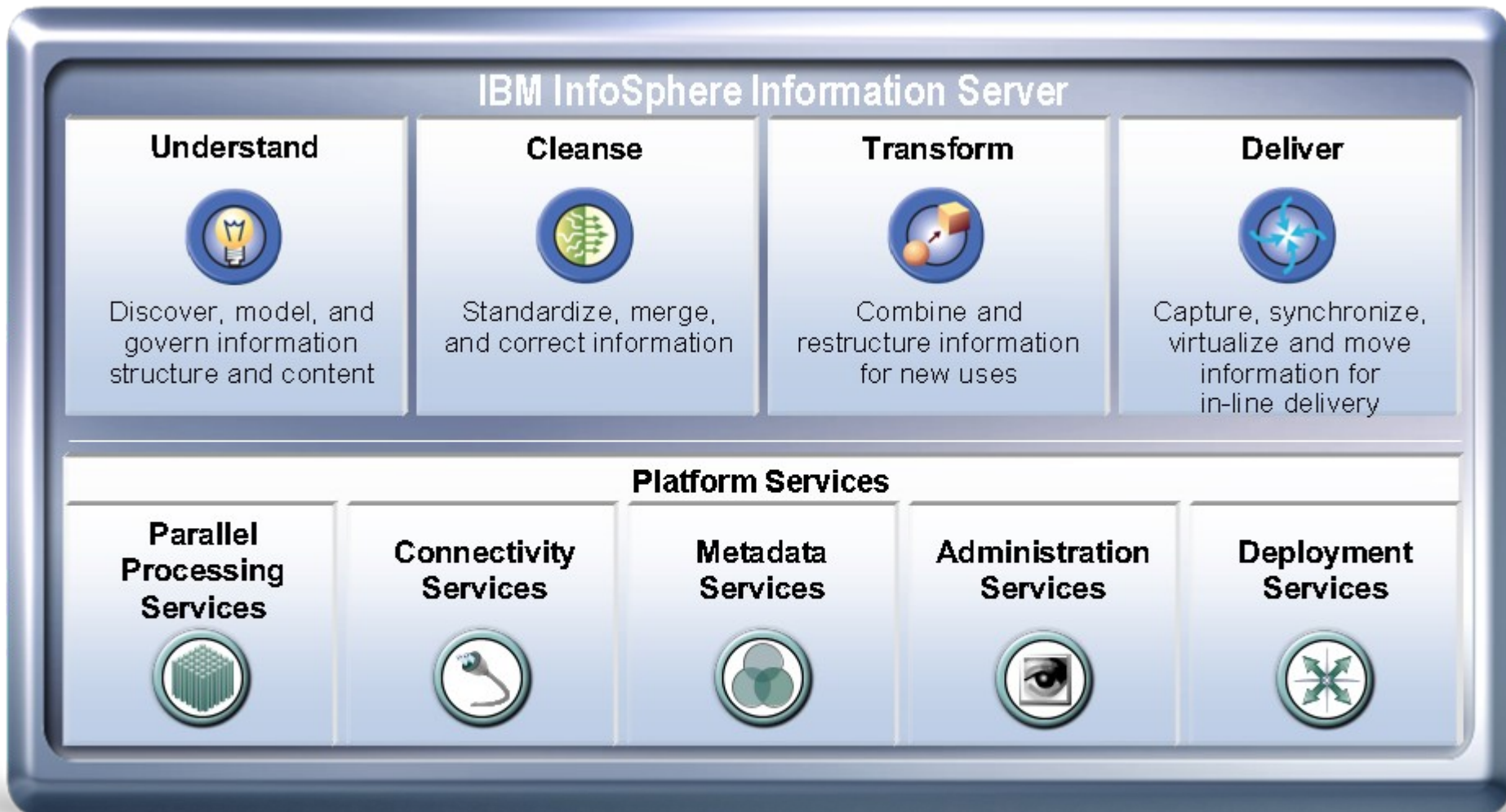
- Precalculate summary / aggregate data by group by's into **MQTs**.

- Reduce storage and increase performance with advanced **Compression**.



IBM InfoSphere Information Server

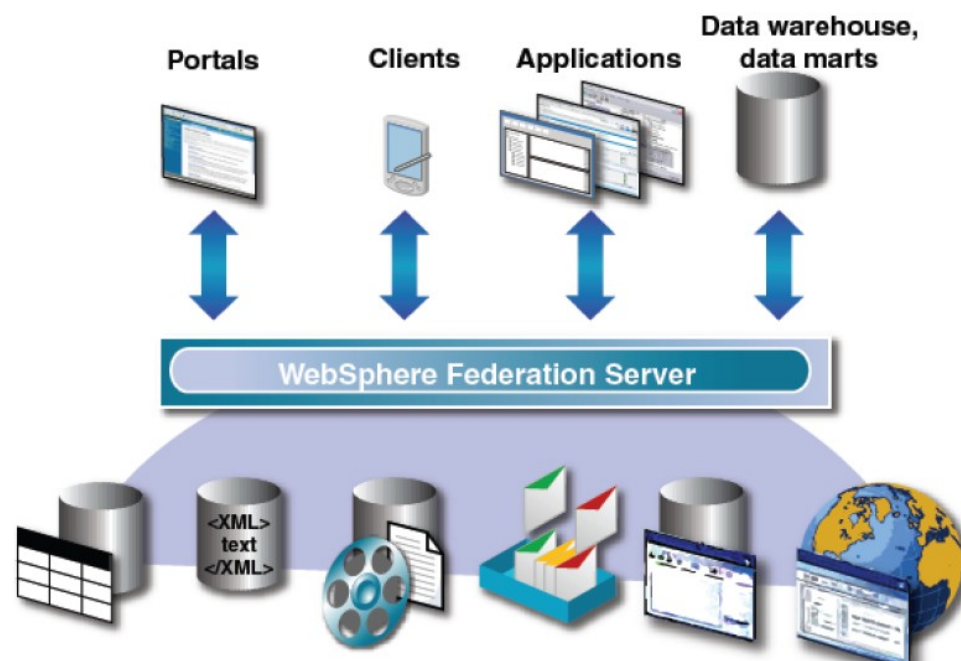
Data integration software platform that helps organizations derive more value from the complex, heterogeneous information spread across their systems.



IBM InfoSphere Federation Server

Creates a consolidated view of your data to support key business processes and decisions.

- Provides access to diverse & distributed information as if it were in one system
 - Single SQL query access to diverse sources
 - Provides visual tools for defining federated queries
- Includes industry-leading query optimization with single sign-on, unified views, and function compensation
- Supports transactional write capabilities across heterogeneous sources
- Enables bi-directional data access services to be published in a SOA



Deliver

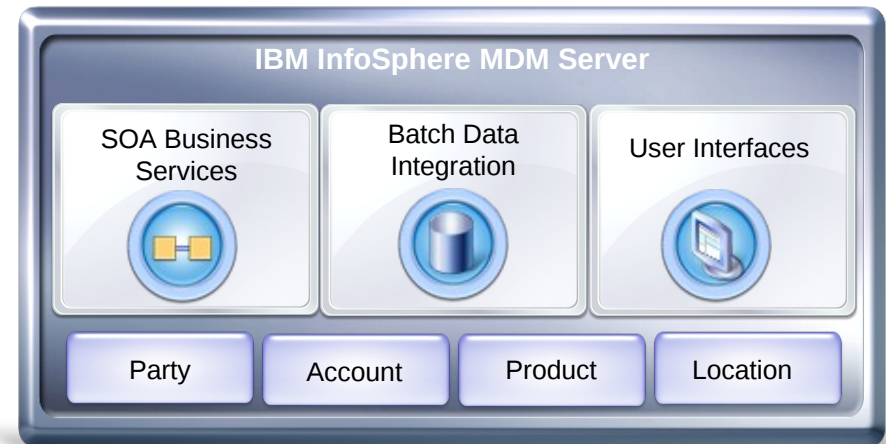
InfoSphere Master Data Management Server, MDM

IBM InfoSphere MDM Server offers organizations the ability to easily and flexibly centralize and manage multiple data domains across a wide set of business requirements where trusted data is required.

- Master data management across party, account & location data
- Leverage master data for frequent, real-time access
- Enabled as an SOA Library with 800 pre-packaged business services
- High performance, high scalability foundation

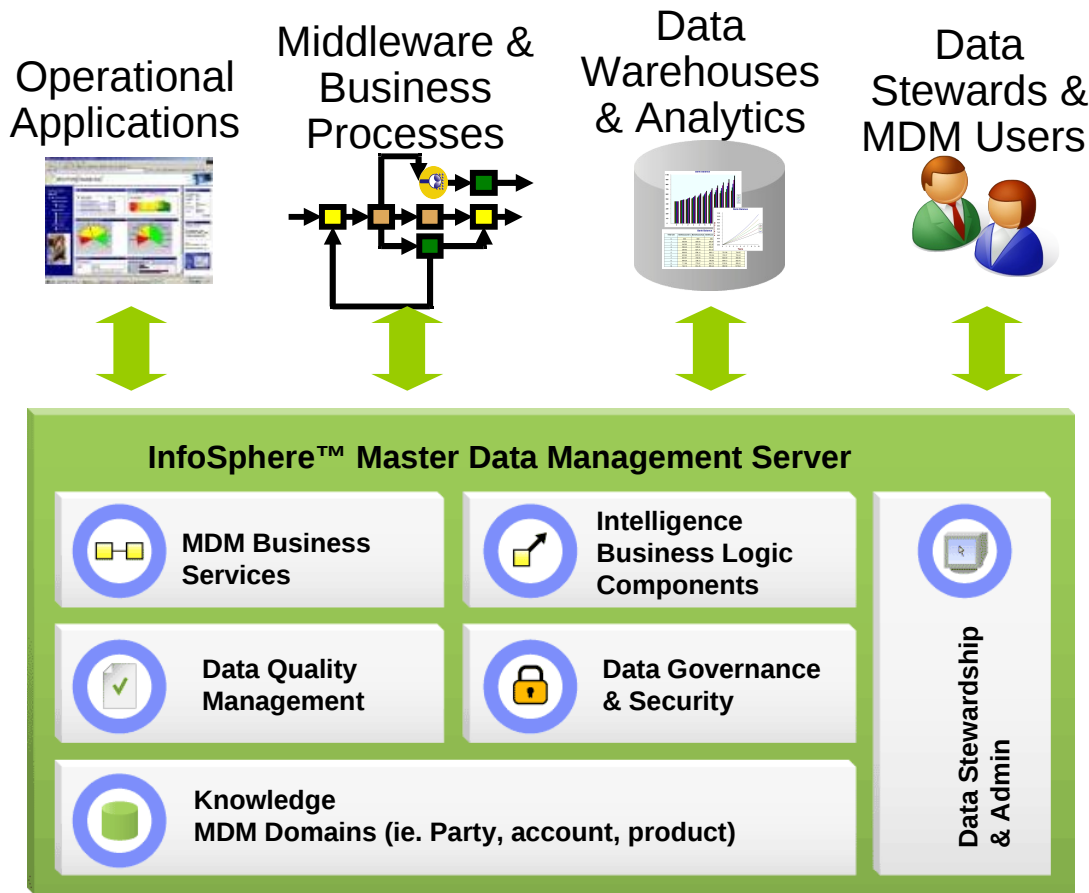
What is Master Data?

- High value information that a company uses across their business
 - *customers, suppliers, partners, products, materials, bill of materials, chart of accounts, location and employees*



IBM InfoSphere Master Data Management Server

InfoSphere MDM Server is designed to serve different users of master data whether these are operational applications, middleware, warehousing and business intelligence, as well as direct MDM application users such as data stewards.



- What is Master Data Management?**
- Provides a consistent understanding and trust of master data entities
 - Provides mechanisms for consistent use of master data across the organization
 - Is designed to accommodate and manage change

Information On Demand – Information Management End-to-End

Unlocking the Business Value of Information for Competitive Advantage

Customer & Product Profitability Financial Risk Insight Workforce Optimization Dynamic Supply Chain Multi-Channel Marketing

Better Business Outcomes

Plan, understand and optimize business performance

Establish, Govern, and Deliver Trusted Information

Optimize content-based Operational & Compliance Processes

Manage data / content over its lifetime



Flexible Architecture for Leveraging Existing Investments

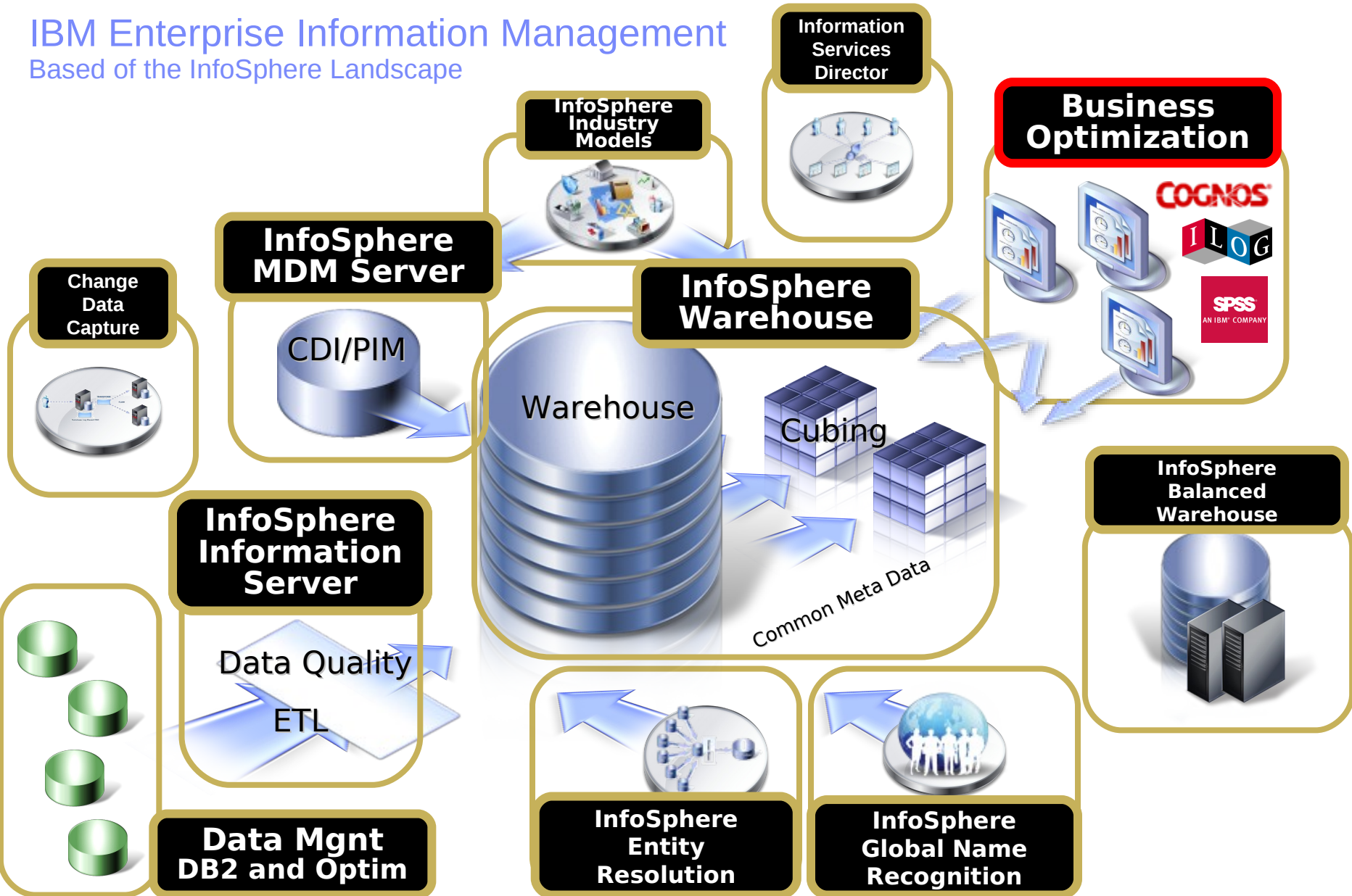


End-to-End Capabilities



IBM Enterprise Information Management

Based of the InfoSphere Landscape



Cognos BI

IBM Cognos 8 Business Intelligence delivers the complete range of BI capabilities: Reporting, Analysis, Dashboarding and Scorecards on a single, service-oriented architecture (SOA). Author, share and use reports that draw on data across all enterprise sources for better business decisions.

- IBM Cognos BI **Reporting** enables you to make smarter business decisions by providing a comprehensive set of reporting capabilities and access to the information you need. Reporting with IBM Cognos 8 BI delivers a single, Web-based, solution for all components of the reporting lifecycle.
- IBM Cognos BI **Analysis** enables the interactive exploration of information regardless of where the data is stored (OLAP and dimensionally modeled relational sources). It is particularly useful for managers and analysts who need to analyze and report trends in organizational performance. IBM Cognos 8 BI Analysis enables you to.
- IBM Cognos Business Intelligence **Dashboarding** solutions help you monitor, measure and manage corporate performance. Dashboards provide an at-a-glance, factual and timely view of business performance. You can identify anomalies that could turn into significant business issues, and you can dig deeper into root causes. IBM Cognos 8 BI Dashboard solutions.
- IBM Cognos BI **Scorecarding** software helps you align your teams and tactics with strategy, communicate goals consistently and monitor performance against targets. You can use IBM Cognos 8 BI Scorecarding to manage the full scope of your business processes.

Cognos BI Scorecarding

The screenshot shows the Cognos Metric Studio interface within a Microsoft Internet Explorer browser. The interface includes a navigation pane on the left with 'Sales' selected, and a main table of metrics. The table has columns for 'Title', 'Actual', 'Target', 'Variance', and 'Time Period'. Three red callouts are present: 'A' points to the 'Metrics' tab in the top navigation bar; 'B' points to the 'No Filter' dropdown menu; 'C' points to the 'Target' column in the table.

	Title	Actual	Target	Variance	Time Period
<input type="checkbox"/>	Employee Survey	6.83	7	-0.17	2003, Q4, November
<input type="checkbox"/>	Pipeline conversion rate	65.57%	50%	15.57%	2003, Q4, November
<input type="checkbox"/>	Order fulfillment	71.45%	92.84%	-21.39%	2003, Q4, November
<input type="checkbox"/>	Head Count	5,456.42	5,222.2	234.21	2003, Q4, November
<input type="checkbox"/>	Customer Acquisition	95.45	100	-4.55	2003, Q4, November
<input type="checkbox"/>	Avg Yield per Customer	US\$76,605.90	US\$67,000.00	US\$9,605.90	2003, Q4, November
<input type="checkbox"/>	Expenses	US\$797,693.96	US\$900,000.00	-US\$102,306.04	2003, Q4, November
<input type="checkbox"/>	Sales Pipeline (Leads)	206.36	300	-93.64	2003, Q4, November
<input type="checkbox"/>	Sales Count	1,057.47	9,847.65	-8,790.18	2003, Q4, November
<input type="checkbox"/>	Absentee days	0.55	0.5	0.05	2003, Q4, November
<input type="checkbox"/>	Avg Purchase Frequency	3.82	4	-0.18	2003, Q4, November
<input type="checkbox"/>	Revenue	US\$1,078,369.55	US\$1,000,000.00	US\$78,369.55	2003, Q4, November
<input type="checkbox"/>	On Time Delivery	7,506.83%	7,800%	-293.17%	2003, Q4, November
<input type="checkbox"/>	Discount Percentage	5.27%	5%	0.27%	2003, Q4, December
<input type="checkbox"/>	Customer Count	450.5	500	-49.5	2003, Q4, November
<input type="checkbox"/>	Customer Survey	7.09	8	-0.91	2003, Q4, November
<input type="checkbox"/>	Backorder count	257.24	267	-9.76	2003, Q4, November
<input type="checkbox"/>	Complaints	413.39	500	-86.61	2003, Q4, November
<input type="checkbox"/>	% Sales from new customers	14.87%	15.1%	-0.23%	2003, Q4, November

Cognos BI

Reporting

The screenshot displays the Cognos BI Reporting tool interface. The main workspace contains several report components:

- Top Left:** A sidebar with 'Predefined Objects' including List, Crosstab, Repeater Table, Repeater, Chart, Map, Block, Table, Image, Hyperlink, and Page Number. A red circle 'A' is next to the 'Page Number' object.
- Top Center:** A title 'Pipeline Health Check for Region: <Office>' and a subtitle 'Revenue / Yield : per Sales Step'. Below it is a table:

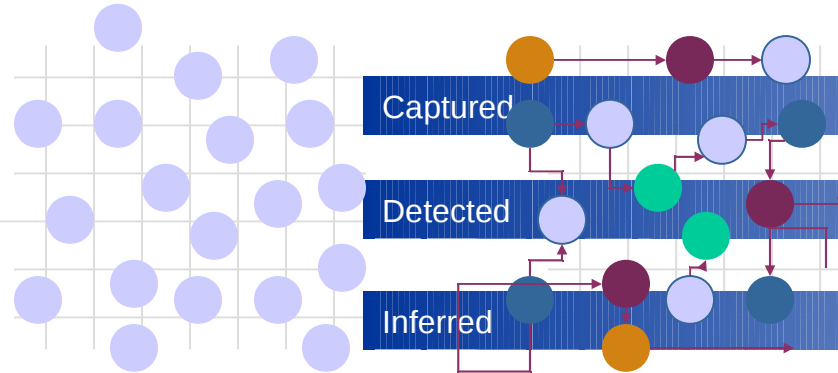
Sales Steps	Win Odds	Revenue	Yield
<Step>	<Win Odds>	<Revenue>	<Yield>
<Step>	<Win Odds>	<Revenue>	<Yield>
<Step>	<Win Odds>	<Revenue>	<Yield>

- Top Right:** A table titled '# of Leads Needed for Quot' with rows for 'Revenue Underway', 'Likely Additional Yield', 'Shortfall to Go', 'Remaining Shortfall to Go', 'New Opportunities Required', and 'Total # of Leads required', each with a corresponding variable placeholder.
- Bottom Left:** A horizontal bar chart titled 'Pipeline for All Regions' with a legend '<#Country#>'. The x-axis is labeled 'Measure (x-axis): <Pipeline>' and has values 25, 50, 75, 100. The y-axis has categories 'abc'. A red circle 'B' is next to the chart.
- Bottom Right:** A line chart titled 'Forecasted / Closed Revenue' with a legend '<#Campaign#>'. The y-axis is labeled 'Measure (y-axis):' and has values 25, 50, 75, 100. The x-axis has categories 'abc'. A red circle 'C' is next to the chart.
- Bottom Center:** A 'Properties - Text Items' panel with sections for Conditional, Text Source, Data, General, and Box.

Business Optimization

Different Types of Analytics

Analytics Sophistication →



What is happening	What could happen? <i>Simulation</i>		
How many, how often, where?			
What exactly is the problem?	What if these trends continue? <i>Forecasting</i>	How can we achieve the best outcome? <i>Optimisation</i>	
What actions are needed?	What will happen next if? <i>Predictive Modelling</i>	How can we achieve the best outcome and address variability? Stochastic Optimisation	Extracting insight, concepts and relationships
Descriptive Analytics	Predictive Analytics	Prescriptive Analytics	Content Analytics

Structured Data & Unstructured Content

Made consumable and accessible to everyone

Descriptive Analytics

Reporting - with Cognos

How are we doing?

Why are we on/off track?

What should we do next?

DASHBOARDING



SCORECARDING



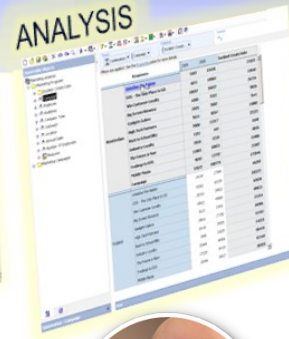
REPORTING



QUERY



ANALYSIS



PLANNING



Executive



Business Manager



Casual Business User



Line Manager



Business Analyst



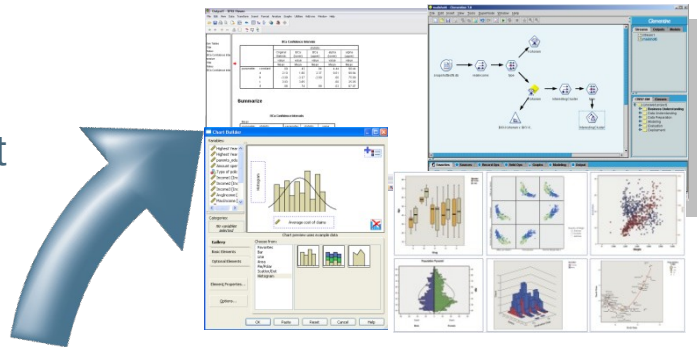
Financial Analyst

Predictive Analytics

Predictive - with SPSS

Analyze ALL forms of data to provide insight and predict the future

Understand



Predict

Recommend the most appropriate action to take

Act



High-value, dynamic



How?

- Interaction data**
- E-Mail / chat transcripts
 - Call center notes
 - Web Click-streams
 - Blogs, tweets

Why?

- Attitudinal data**
- Opinions
 - Preferences
 - Needs & Desires

Who?

- Descriptive data**
- Attributes
 - Characteristics
 - Self-declared info
 - Demographics

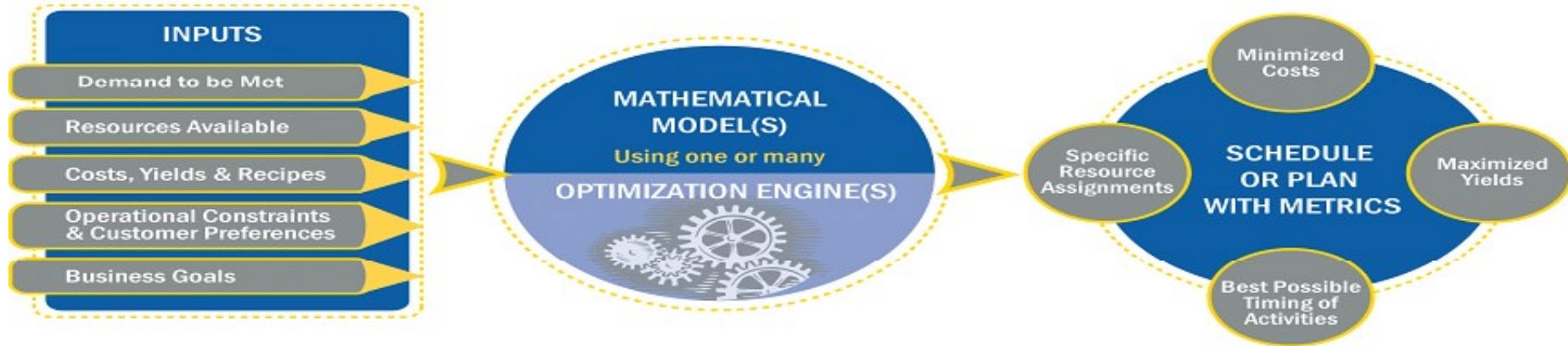
What?

- Behavioral data**
- Orders
 - Transactions
 - Payment history
 - Usage history

"Traditional"

Prescriptive Analytics

Optimizing - with ILOG

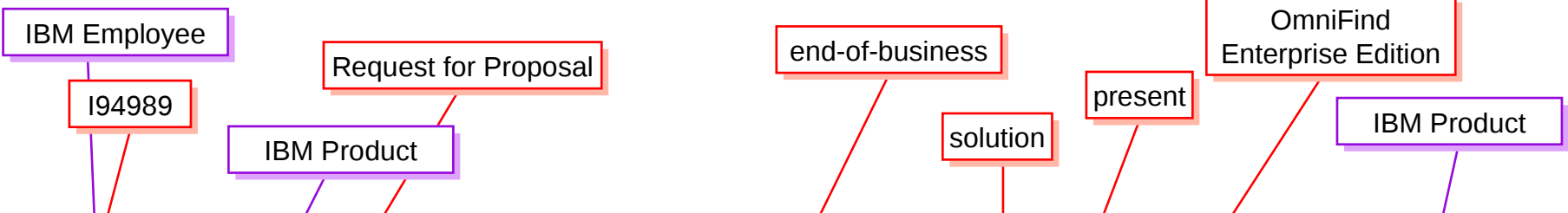


Based on what we know and have predicted –
how to optimize day to day operations –
or strategic planning –
exploring alternatives –
and understanding trade-offs

Also based on what we know is variable –
Stochastic optimization

Content Analytics

Extracting, meaning & relationships

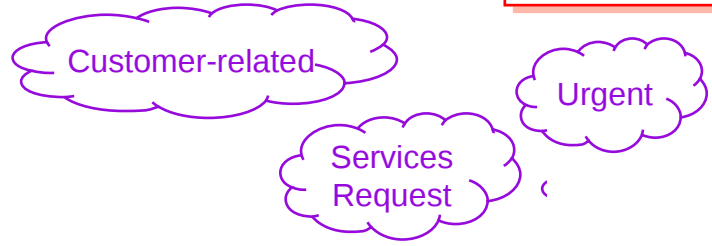


Marie,
 I have an *OmniFind* RFP to complete for *Acme Corp.* by EOB Friday. We are presenting OEE, UIMA, *WebSphere Portal*, and LanguageWare as the key components of the solution. To deliver this soln. we need LW support for creation of custom annotators, especially for *named entity recognition*. *DJ* and *Alex* mentioned that you were adding parsing to LW and were merging *James Luke's Swallow* with *LW workbench*. When will this be ready for customers? Also, could you provide *software services* as part of this RFP as the customer will need support in creating custom annotators?
 Thomas (thomas.hampp@ie.ibm.com)

LanguageWare

Swallow and LanguageWare merging.

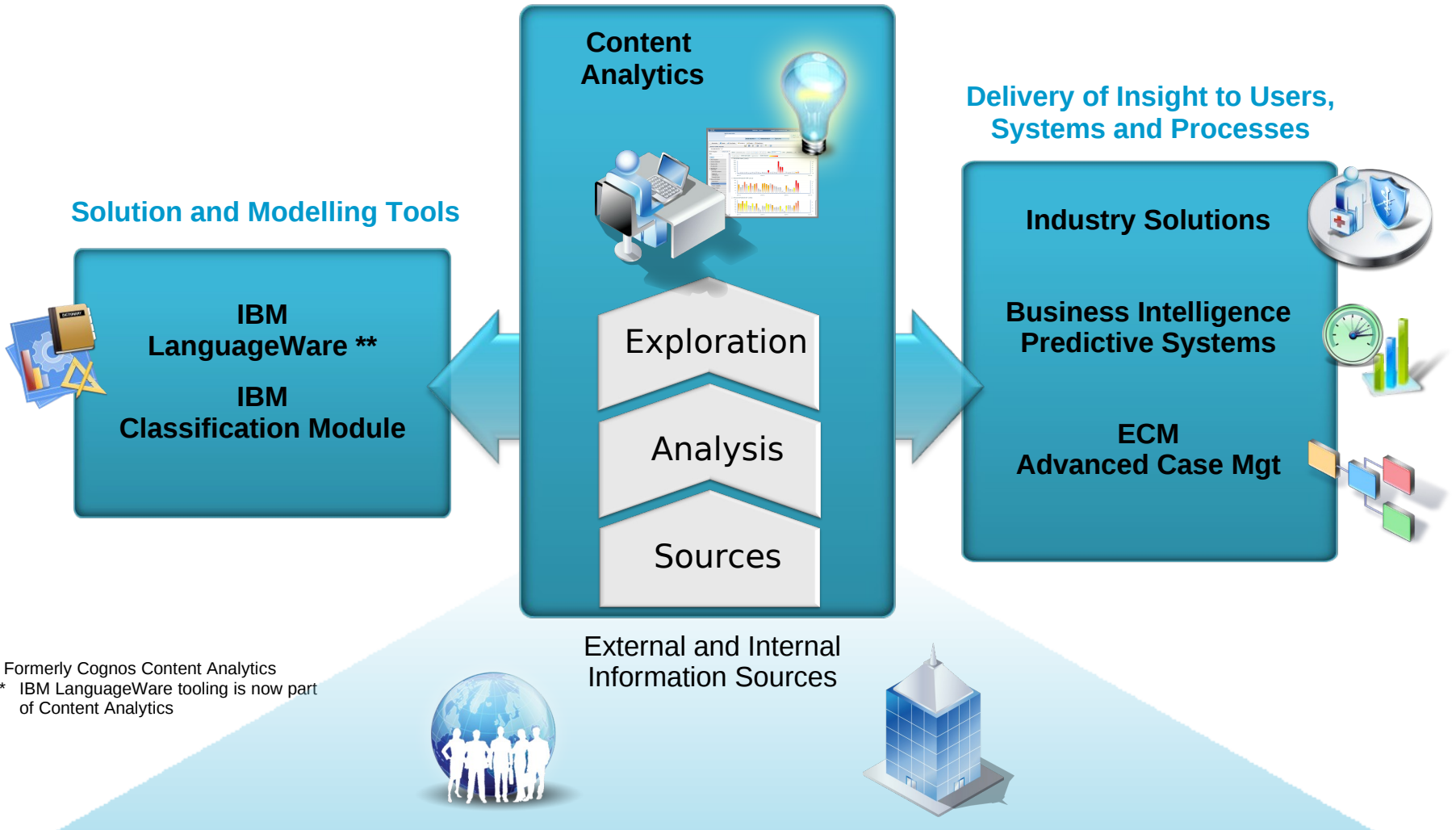
Acme Corp. request OmniFind RFP



English

Content Analytics

Interactive Assessment and Discovery of Business Insight



* Formerly Cognos Content Analytics
** IBM LanguageWare tooling is now part of Content Analytics

Information On Demand – Information Management End-to-End

Unlocking the Business Value of Information for Competitive Advantage

Customer & Product Profitability Financial Risk Insight Workforce Optimization Dynamic Supply Chain Multi-Channel Marketing

Business Optimization

Better Business Outcomes

End-to-End Capabilities



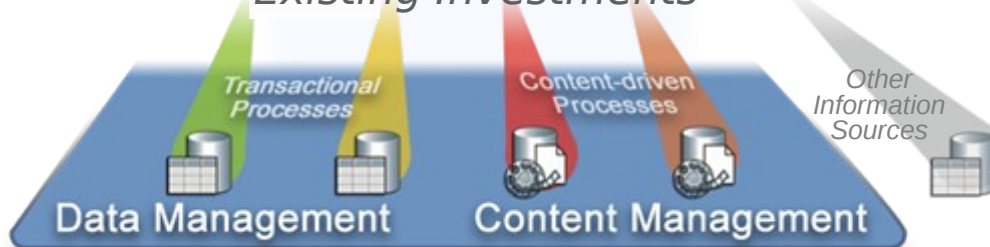
Plan, understand and optimize business performance



Establish, Govern, and Deliver Trusted Information

Flexible Architecture for Leveraging Existing Investments

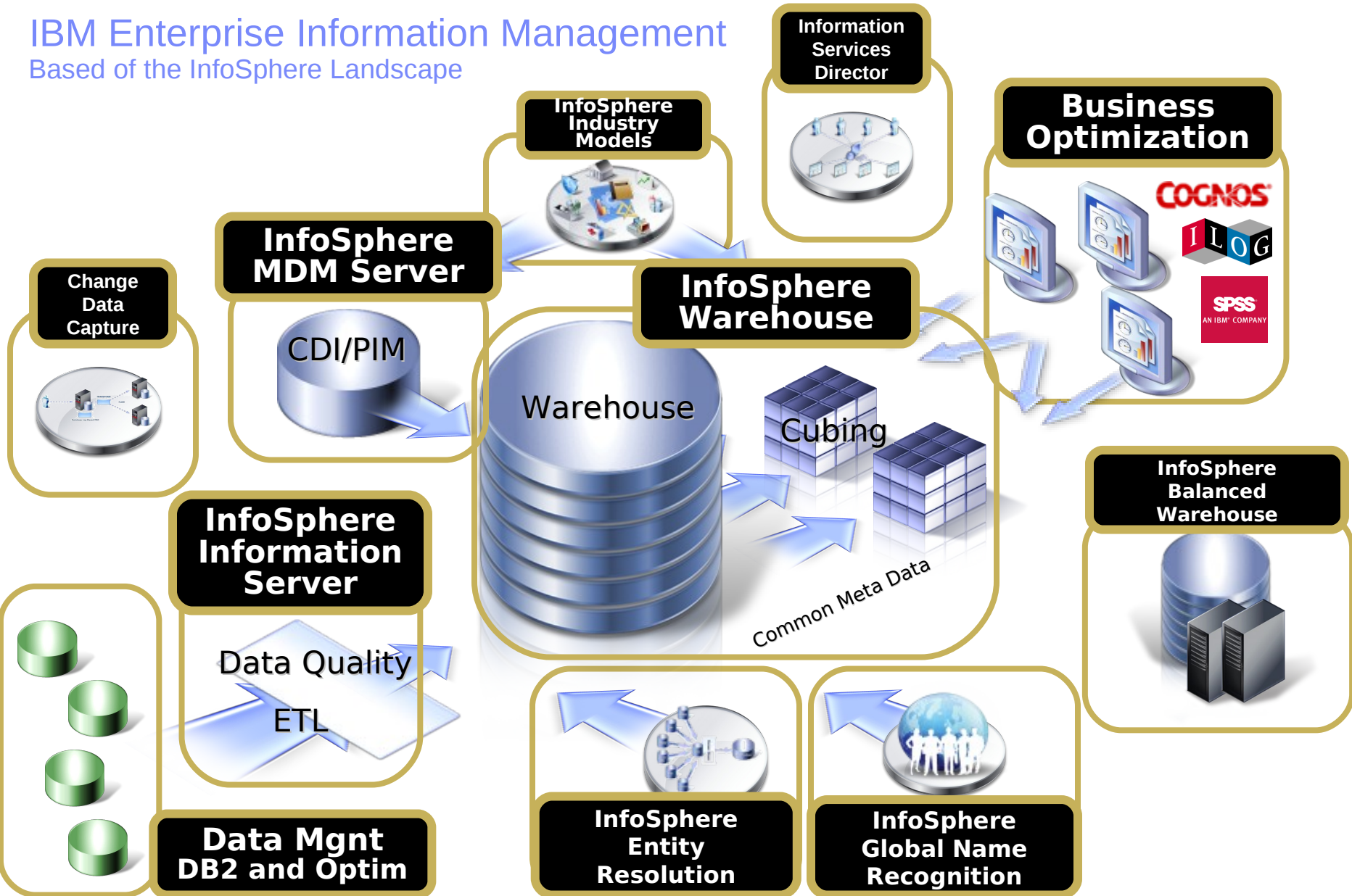
Optimize content-based Operational & Compliance Processes



Manage data / content over its lifetime

IBM Enterprise Information Management

Based of the InfoSphere Landscape



The road ahead for Linux on System z is brighter than ever!

Unbeatable:

- Virtualization Options
- Reliability
- Scalability
- Security
- Efficiency
- Flexibility



Thank you – Any questions ?

Obrigado

Portuguese

Merci

French

Thank You

English

Gracias

Spanish

Danke

German



ibm.com/linux

Linux and IBM:
In-demand skills for an on demand world.

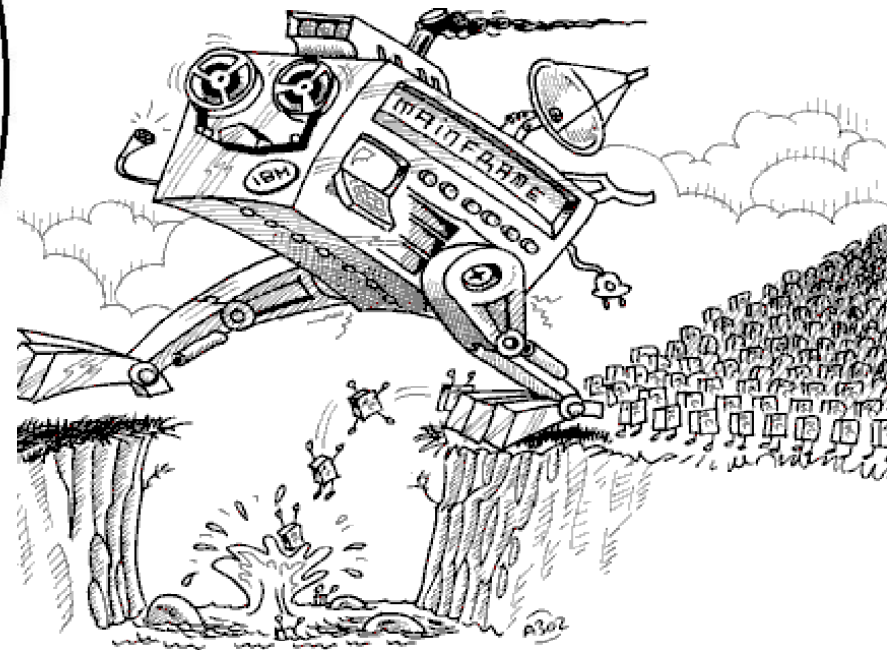
IBM

LIBERTE



ibm.com/education/students

Some fun at the end ...



Trademarks

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries.

AIX*	ESCON*	Multiprise*	S/390 Parallel Enterprise Server	System i5*	z/VM
CICS*	FICON	Netfinity	SecureWay	System x	zSeries
DB2*	IBM*	OS/390*	System/390*	VSE/ESA	xSeries
DB2Connect	IBM logo*	PR/SM	System z9*	Virtualisation Engine*	pSeries
DB2 Universal Database	IMS/ESA	RS/6000*	System p5*	WebSphere	BladeCenter
e-business logo	MQSeries*	S/390*		z/OS	On Demand

* Registered trademarks of IBM Corporation

The following are trademarks or registered trademarks of other companies.

Intel is a trademark of the Intel Corporation in the United States and other countries.

Java and all Java-related trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc., in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation.

SET and Secure Electronic Transaction are trademarks owned by SET Secure Electronic Transaction LLC.

UNIX is a registered trademark of The Open Group in the United States and other countries.

* All other products may be trademarks or registered trademarks of their respective companies.

Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment.

The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the 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.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

This presentation and the claims outlined in it were reviewed for compliance with US law. Adaptations of these claims for use in other geographies must be reviewed by the local country counsel for compliance with local laws.

Legal

© Copyright IBM Corporation 2010

IBM Corporation
New Orchard Road
Armonk, NY 10504
U.S.A.

Produced in the United States of America
06-08
All Rights Reserved

IBM, the IBM logo and ibm.com are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at www.ibm.com/legal/copytrade.shtml.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

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

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product and service names may be trademarks or service marks of other companies.

References in this publication to IBM products and services do not imply that IBM intends to make them available in all countries in which IBM operates.