IBM Business Intelligence (BI) and Analytics Update

Mike Biere
IBM

March 2nd, 2011 8am – 9am

Analysts forecast next generation analytics systems

By 2013, 33% of business intelligence functionality will be consumed via ***handheld devices.***

By 2013, 15% of BI deployments will ***combine BI, collaboration and social software*** into decision-making environments.

Source : Gartner, Predicts 2011: New Relationships Will Change BI and Analytics, November 2010 ,
Bill Gassman, Rita L. Sallam, Andreas Bitterer, John Hagerty, Neil Chandler

Mash ups

- ***By 2014, externalizing BI will increasingly become an expected aspect of most companies' relationships with customers and partners.***
- Externally focused BI programs will frequently go beyond information dissemination by facilitating a collaborative decision-making process that breaks through the firewall to involve stakeholders from organizations in a broad ecosystem.

Source : Gartner, **Prepare for Customer-Facing Business Intelligence**, Kurt Schlegel ,October 2010

By 2012, BI Platform capabilities will be embedded as a service within **75% of new business applications**

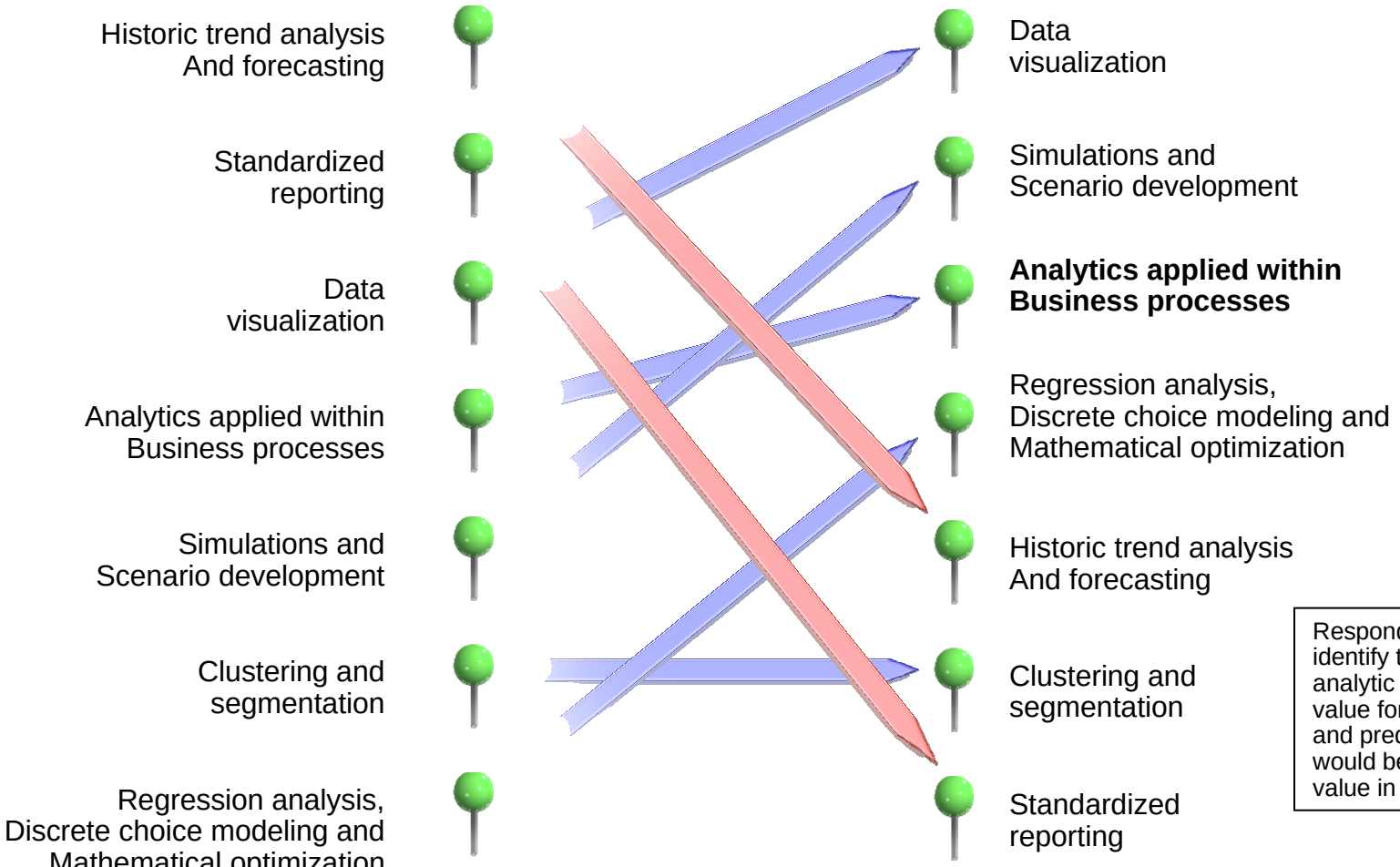
By 2012, emerging technologies will significantly drive adoption of **BI to 50% of business users** (e.g. interactive visualization, in-memory analytics, search, SaaS and SOA)

Source : Gartner BI Summit 2008, 4/2008

Embedded Analytics

What Matters … is changing

New Intelligence Enterprise Survey of 3,000 executives



Respondents were asked to identify the top three analytic techniques creating value for the organization and predict which three would be creating the most value in 24 months.

Source: MIT Sloan Management Review,10 Data Points: Information and Analytics at Work, N Kruschwitz and R Shockley, Fall 2010

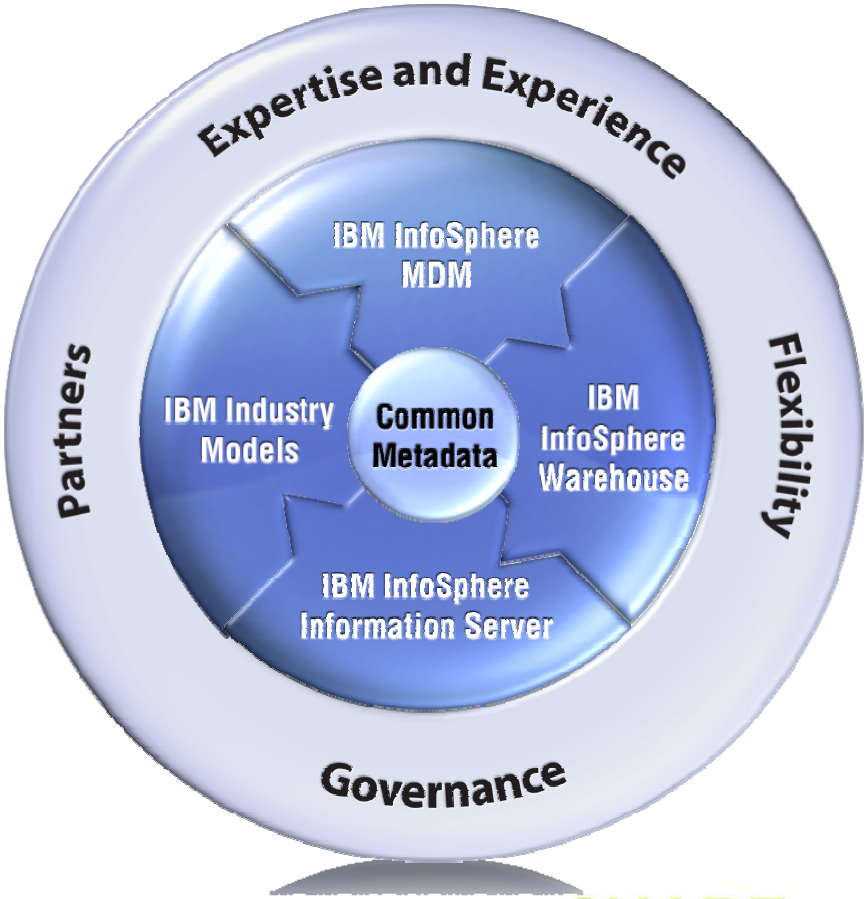
IBM customers have demanded …
… and we have responded

- ***Data Warehousing technologies for System z from IBM***
  - ✓ InfoSphere Information Server
  - ✓ InfoSphere Warehouse
  - ✓ IBM Smart Analytics System 9600
- ***Database enhancements for BI/BA***
  - ✓ DB2 for z/OS V10
  - ✓ ISAO – IBM Smart Analytics Optimizer
- ***Business Intelligence and Business Analytics***
  - ✓ Cognos 10 for Linux on System z
  - ✓ SPSS for Linux on System z
  - ✓ IBM Smart Analytics Cloud (a result of IBM's Blue Insight Project)

The IBM InfoSphere Vision … defining an infrastructure

An Industry Unique Information Platform

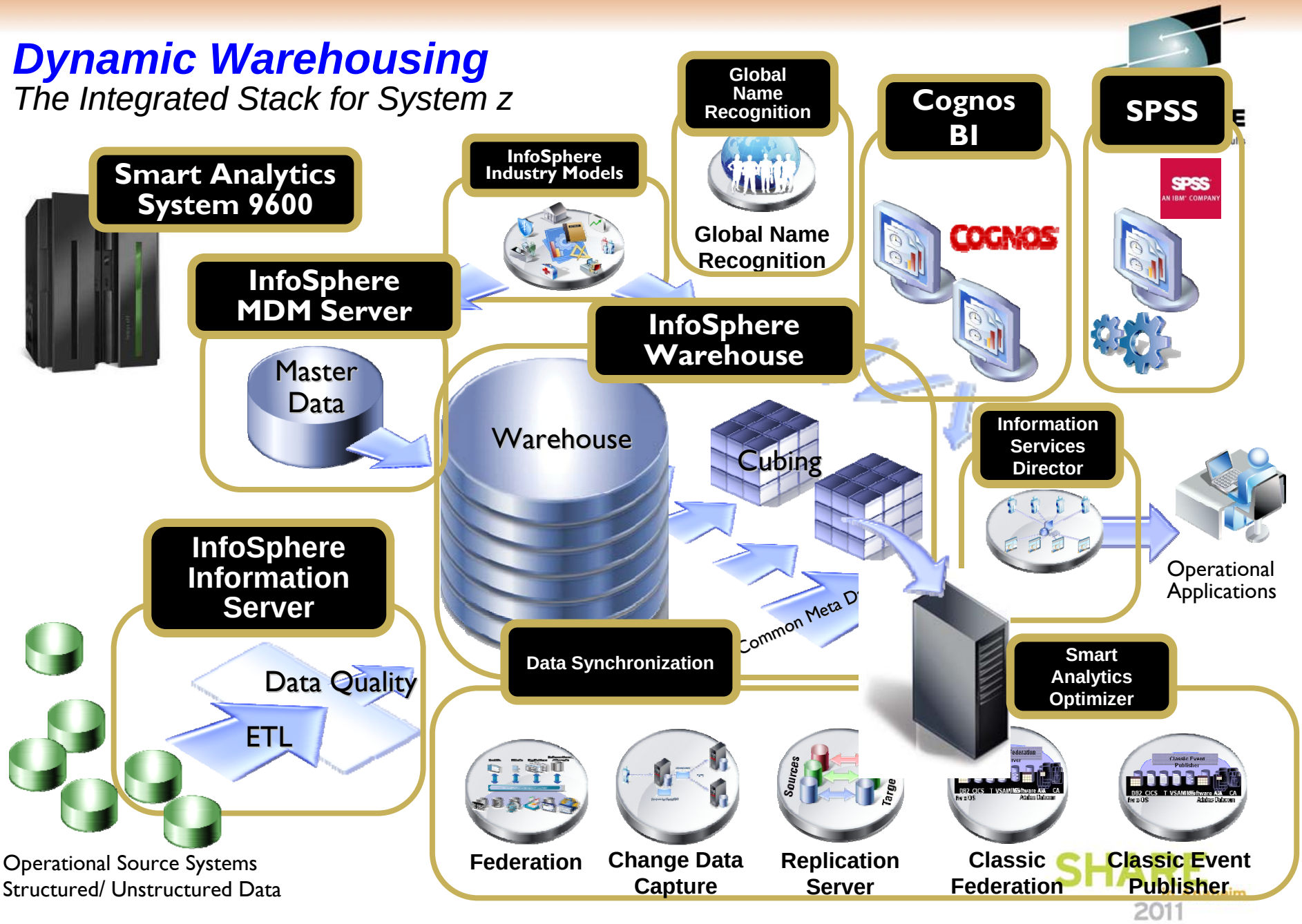
- Simplify the delivery of Trusted Information
- Accelerate client value
- Promote collaboration
- Mitigate risk
- Modular but Integrated
- Scalable – Project to Enterprise



InfoSphere™

Dynamic Warehousing

The Integrated Stack for System z



System z selected to meet critical business needs

High business growth

HIGH SCALABILITY

Continuous business operations

HIGH AVAILABILITY /RELIABILITY

Flexibility and speed to respond

EXTREME VIRTUALIZATION

Reduce business risk

SECURITY

Green strategy Energy and space

EFFICIENCY

Secure Cloud Services

CLOUD

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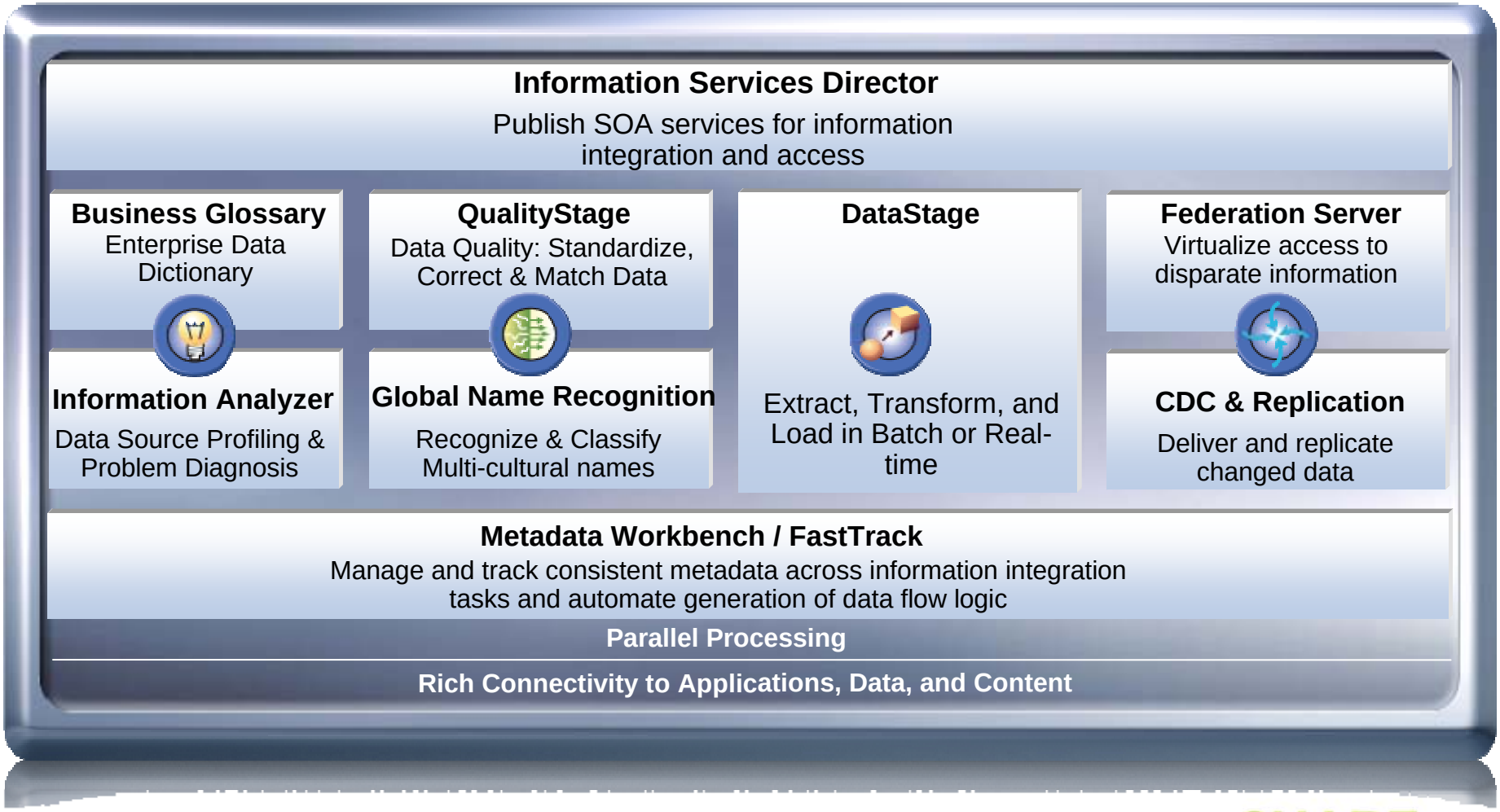
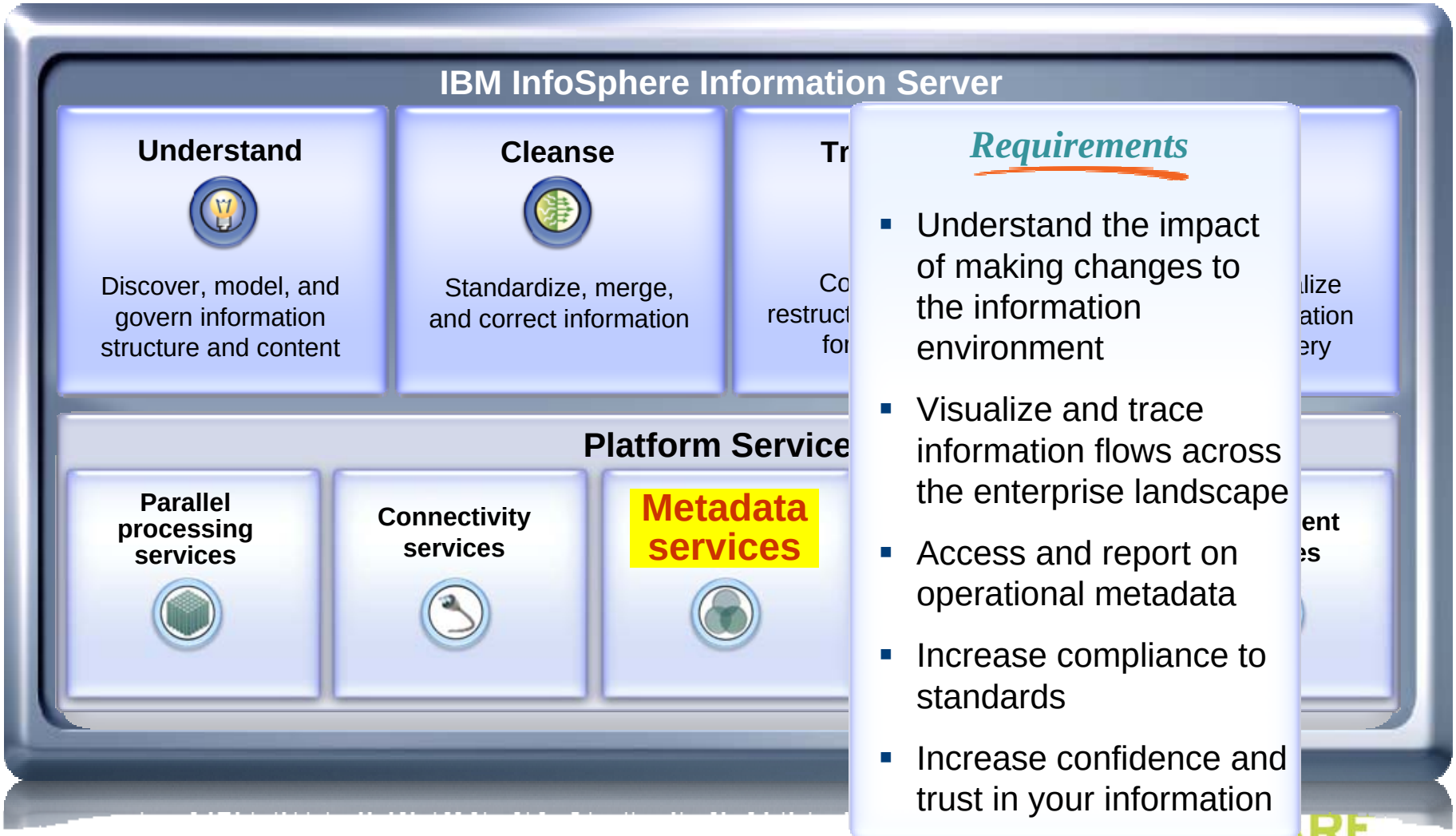
Data Warehousing Enhancements

InfoSphere Information Server - for Linux on System z



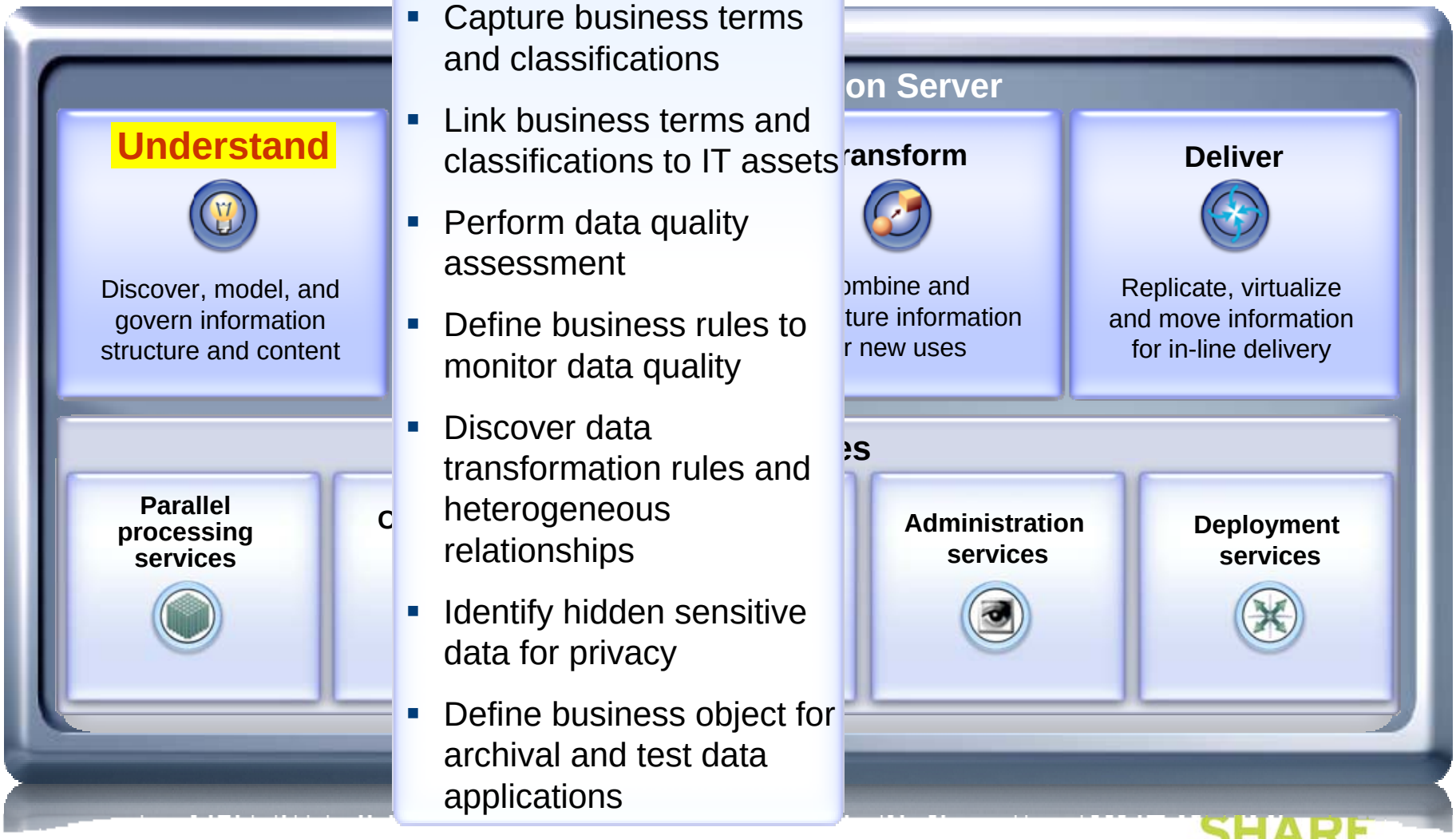
InfoSphere Information Server & Foundation Tools



Requirements

- Understand the impact of making changes to the information environment
- Visualize and trace information flows across the enterprise landscape
- Access and report on operational metadata
- Increase compliance to standards
- Increase confidence and trust in your information

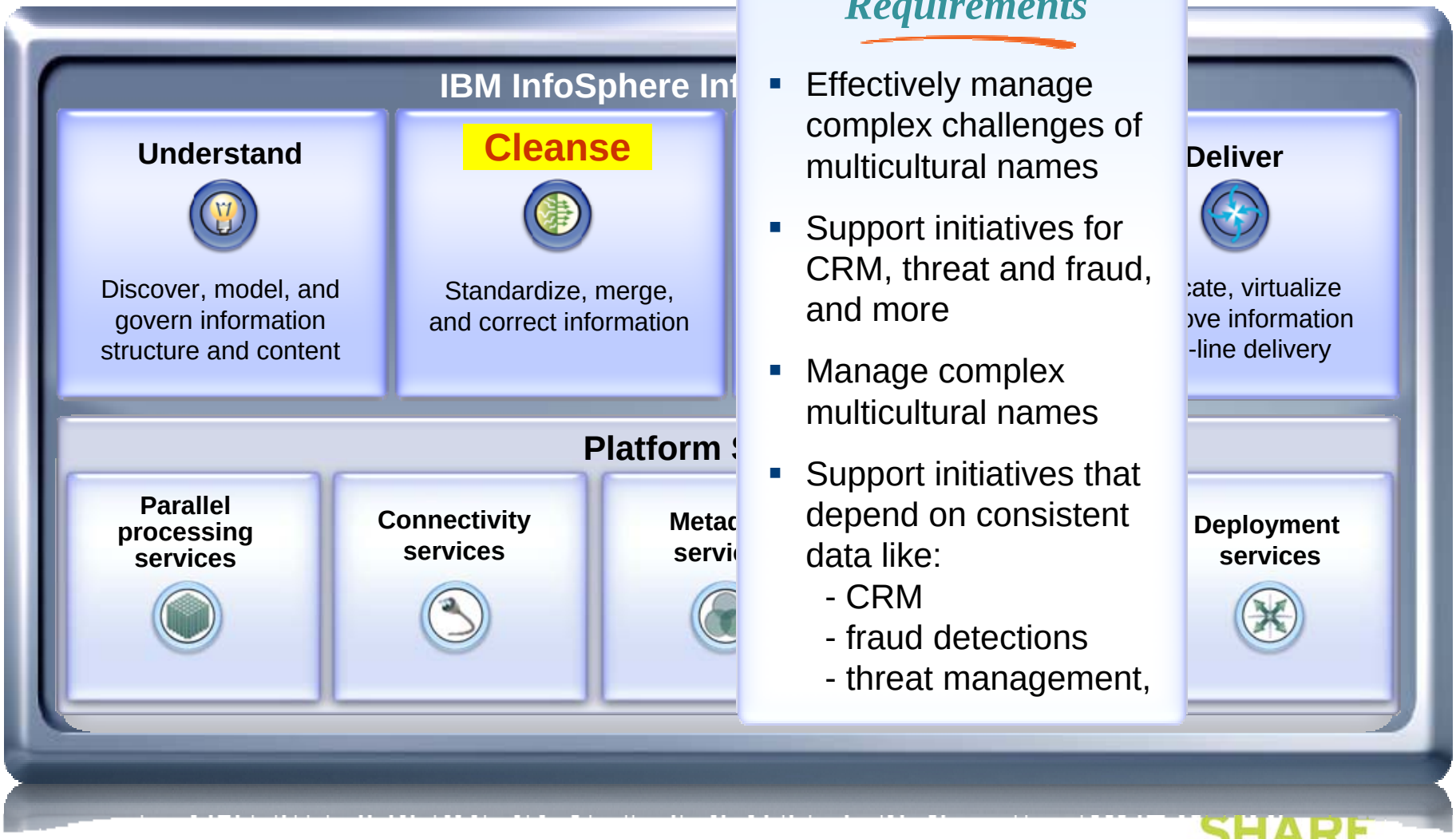
InfoSphere Information Server & Foundation Tools



Requirements

- Capture business terms and classifications
- Link business terms and classifications to IT assets
- Perform data quality assessment
- Define business rules to monitor data quality
- Discover data transformation rules and heterogeneous relationships
- Identify hidden sensitive data for privacy
- Define business object for archival and test data applications

InfoSphere Information Server & Foundation Tools



Requirements

- Effectively manage complex challenges of multicultural names
- Support initiatives for CRM, threat and fraud, and more
- Manage complex multicultural names
- Support initiatives that depend on consistent data like:
  - CRM
  - fraud detections
  - threat management,

InfoSphe… …erver & Foundation Tools

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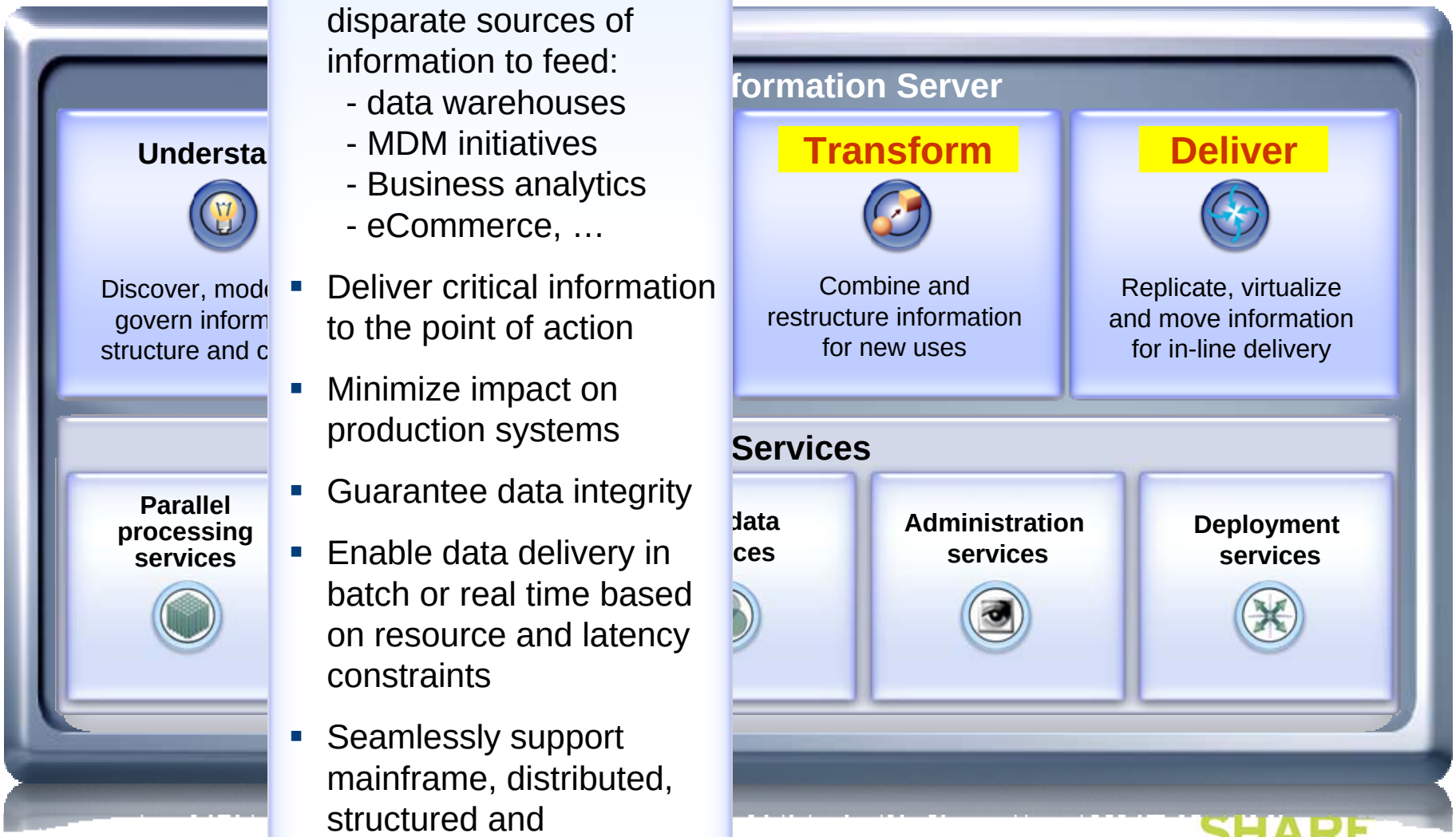
Requirements

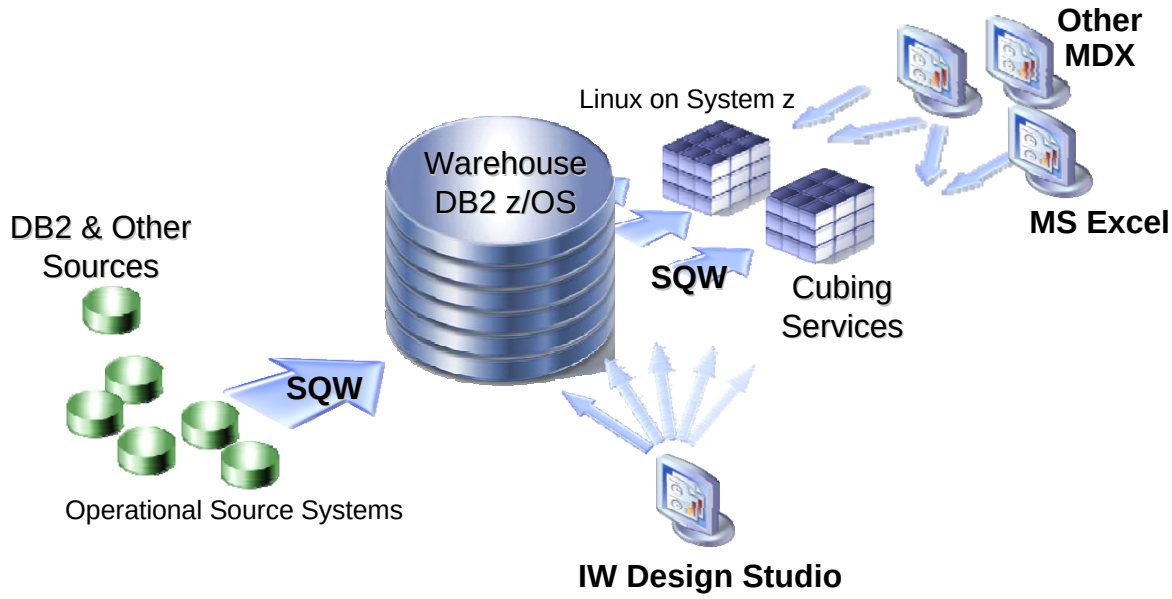
- Integrate and transform multiple, complex, and disparate sources of information to feed:
  - data warehouses
  - MDM initiatives
  - Business analytics
  - eCommerce, …
- Deliver critical information to the point of action
- Minimize impact on production systems
- Guarantee data integrity
- Enable data delivery in batch or real time based on resource and latency constraints
- Seamlessly support mainframe, distributed, structured and unstructured data sources



InfoSphere Warehouse on System z

Delivers Data Warehouse Suite on System z -

- ***Advanced physical database modeling and design – Design Studio***
- ***In-database data movement and manipulation capabilities of SQL Warehouse Tool (SQW)***
- ***Optimize multidimensional reporting and analysis of data with Cubing Services***



Key Component Overview - Warehouse for tooling DB2 for z/OS

- **Data Server Component – Prerequisite**
  - DB2 for z/OS -- Not included in the offering, prerequisite
    Application Server Components – Linux on System z Partition
  - WebSphere Application Server
    - Manages/executes the SQW runtime processes
    - Server for the browser-based Admin Console
  - **SQW Runtime**
    - **Execution engine for SQW jobs (control flows, data flows)**
    - **Runs in the WAS environment**
  - **Cubing Services engine**
    - **Cube server providing cube access to MDX clients through ODBO and XMLA**
    - **Cubing engine and cube optimizer ported to Linux on System z.**
- **Design and Administration Client Components – Windows, Linux**
  - Design Studio, Eclipse-based design tool
    - Physical modeling based on Rational Data Architect (RDA)
    - SQW Data flow, control flow editor – extension of RDA
    - Cubing Services cube model editor, optimization tool – extension of RDA
  - Admin Console, browser-based administration tool
    - Common admin tasks, data source, role-based security assignments
    - Cube metadata management (import/export)
    - Cube Server management (configure / start / stop, etc.)
    - SQW runtime job administration

IBM Smart Analytics System 9600

Unprecedented Value in Deploying New Business Analytics

What is it?

The IBM Smart Analytics System 9600 is an integrated solution of hardware, software and services that enables customers to rapidly deploy cost effective game changing analytics across their business.

How is it different?

- *Secure, Available Business Analytics*
  - Rapidly delivers analytic information to decision makers at the time of decision.
  - New environment for the availability, reliability and scalability necessary to stay aligned with the operational systems
- *Simplified administration*
  - Appliance-like delivery
  - Faster deployment at lower cost.
  - Leverages customers existing disaster recovery, and backup processes
- *Proven Operational Characteristics*
  - Extends the qualities of service of System z.
  - Reduces risk through extending System z manageability and security across the entire system.
- *High Value Operational BI*
  - Cost effective way to drive daily operational decisions

Delivering business results in days, not months

IBM Smart Analytics System 9600 Software

Deeply Optimized by IBM Experts… Flexible Growth…

Powerful Data Warehouse and BI Software

- DB2 for z/OS Value Unit Edition (primary) V9
  Option for MLC
- DB2 Utilities Suite V9
- InfoSphere Warehouse on System z V9.5.2
- Cognos 8 BI for Linux on System z V8.4
- z/OS Operating System Stack V11

Optional Value Priced Add-ons

- Tivoli OMEGAMON for DB2 Performance Expert
- DB2 Connect
- Tivoli Directory Server
- InfoSphere Information Server
- InfoSphere Replication Server
  - Q-Rep, CDC and Event Publisher eligible
- InfoSphere Federation Server plus Classic Federation on System z
- SPSS
- Tivoli ITCAM, ITUAM
- Cognos Now! For Linux on System z
- Cognos Blueprints for Healthcare, Banking and others…
- BI User on-boarding application (as proposed for Smart Analytics Cloud)

Database Enhancements

DB2 V10 for z/OS What's exciting?

Efficiency	• CPU reduced: transactions & queries • ***Ten to twenty times more concurrent users***
Resiliency	• More online schema changes • Concurrency for catalog & utilities • Improved security controls and audit
Applications	• Versioned data or ***temporal queries*** • pureXML and SQL enhancements

→ Productivity improved for DBAs, application programmers, & systems – ability to *'leap' from V8 → V10*

IBM Smart Analytics Optimizer
Technology Preview for System z

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What is it?

- ✓ A high performance extension that is ***integrated with IBM DB2 for z/OS*** delivering predictable, order-of-magnitude faster, analytic query response times, while lowering

How is it different

- ✓ **Deep integration with IBM data management systems**
- ✓ **High performance query software, based on advanced data in-memory technologies**
- ✓ **Leveraging existing data system investment and values without any changes to applications**
- ✓ **For System z, extends gold-standard manageability, security, and availability to high-performance analytic applications**

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Orders of Magnitude Faster for Queries

Beta Customer Results

For customers who have struggled with gaining the required performance out their complex queries of full table scans, multiple compares, and complex logic – *the results are astounding!*

... and its acceleration factor : :

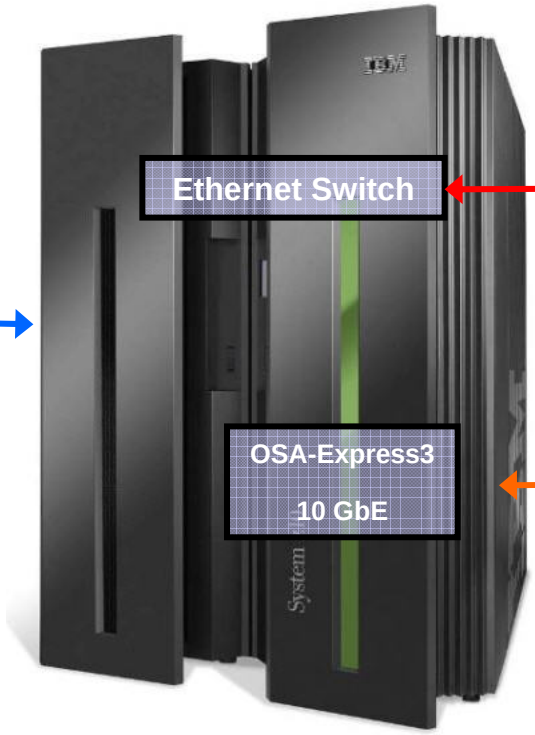
Runtime of queries w/o ISAO	Factor	with ISAO
163 s	48	3s
2311 s	511	5s
25 s	12	2s
1593 s	206	8s
35 s	4	8s
5435 s	1424	4s

IBM Smart Analytics Optimizer Product Components

CLIENT

Data Studio Foundation Smart Analytics Optimizer Admin Plug-in

zEnterprise



Data Warehouse application DB2 for z/OS enabled for Smart Analytics Optimizer

Private Service Network

Private Data Network

zBX

IBM Smart Analytics Optimizer

Fibre Channel

DS5020 Disk

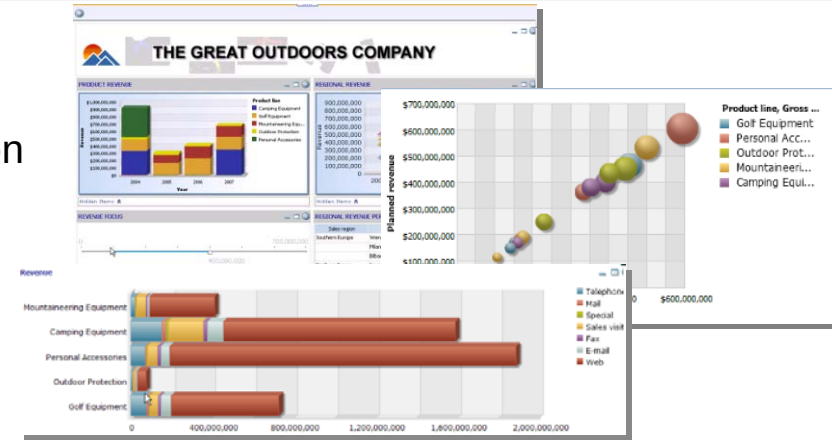
Business Analytics Enhancements


10
COGNOS
INTELLIGENCE UNLEASHED

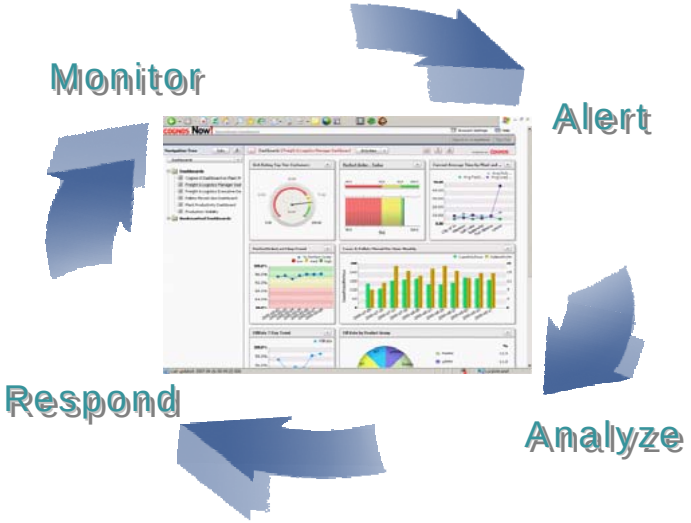
Measure and Monitor to See "How" You're Doing

Dashboards

- Provide at-a-glance, high impact views of complex information
- Help quick focus on issues that need attention and action
- Combine information across disparate sources
- Benefit from range of highly visual personalized, managed, or self-assembled dashboards
- Gain personalized views of operations with continuous monitoring



Real-time Monitor Business Operations



- Continuously monitor and alert when exceptions occur to take immediate action
- Detect events, anomalies and trends in data streams flowing through transactional and messaging systems
- Aggregate data streams across multiple transactional systems and data sources
- Enable self-service with user-defined dashboards, operational KPIs, and alerts
- Address full operational decision cycle from detection to action

Understand the "Why" Behind Business Performance

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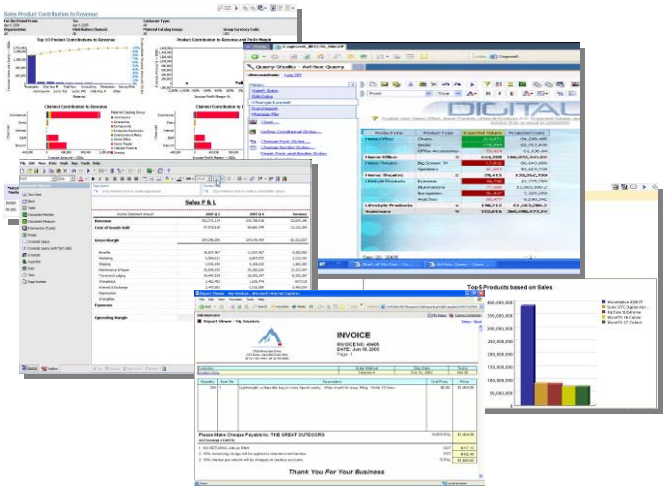
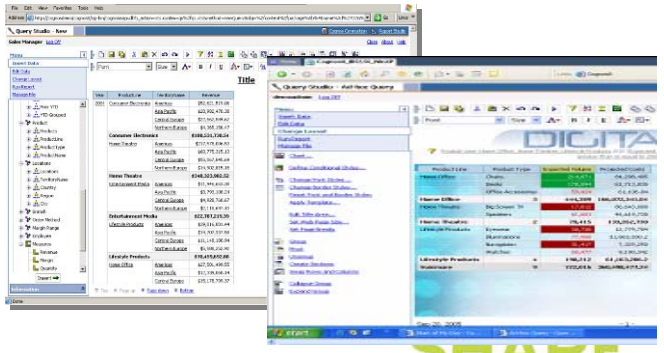
Reporting



- Address full breadth of report needs (personalized, transactional, management, statutory, production…)
- Deliver consistent information across all types of output
- Personalize and target to each department/individual without having to re-author
- Re-use queries, analyses, express author reports in business and collaborate on design with IT
- Easy access to data lineage, definitions of terms, and annotations

Ad-hoc Query

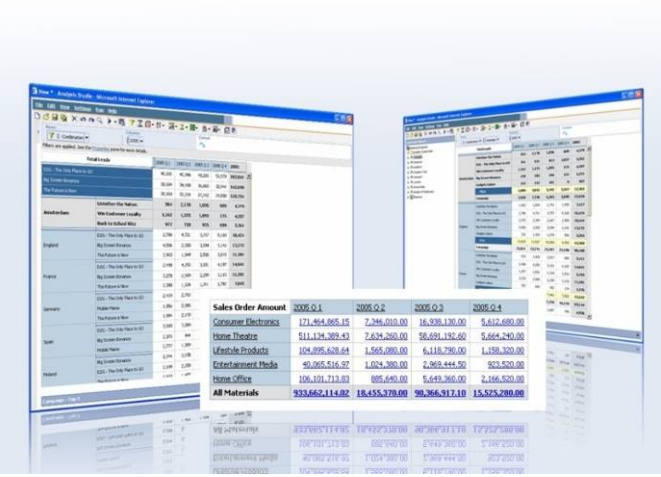
- Intuitive, self-service reporting
- Access to all data; drag and drop query creation
- Easy sorting and filtering
- Corporate templates for consistency
- Share ad-hoc or promote for professional distribution



Dig Deeper - Investigate Possible Better Outcomes

Analysis

- **Compare and contrast to reveal symptoms and causes behind trends**
- **Gain same analysis experience on Web or in Excel interfaces**
- **Perform personal exploration across multiple dimensions of information**
- **Move from summary level to detail effortlessly**



Enhance decisions with Statistics and Predictors of "What Might Happen"

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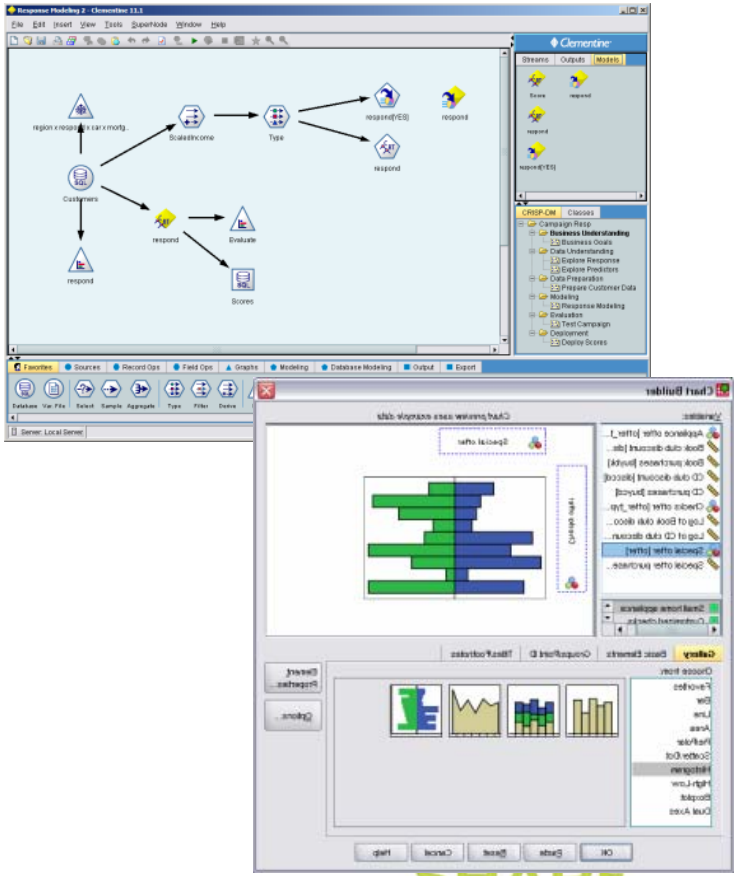
Predictive Analytics

- High-performance data mining and text analytics workbench
- **Quickly delivers positive ROI by creating the predictive intelligence**
- **Set of mining algorithms that provide insight and prediction**
- **Enables the discovery of key insights, patterns and trends in data that can be used to optimize business decisions**
- Advanced statistics and data management for analysts researching business problems
  - Analysis, interpretation, explanation and presentation of data
  - Provides insight into a sample of data and tools for prediction and forecasting based on the data
- Flexible enterprise foundation for managing and deploying analytics throughout the organization



Flexible Access Wherever and Whenever Needed

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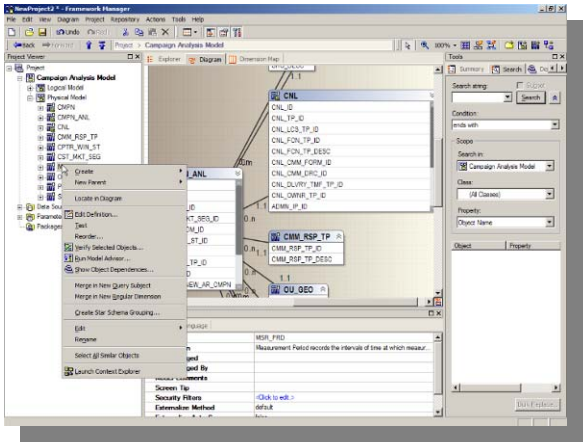
BI Anywhere

- Receive in any format (PDF, HTML, Excel, XML…)
- Deliver in any language with robust Unicode support
- Access refreshable BI content in any location that best serves the individual (Excel, PowerPoint, Word, Enterprise Search, Portal)
- Search to find instant answers, related content and to author based on search terms
- Browse BI content on mobile devices including BlackBerry, Windows Mobile and Symbian devices
- Automate personal alerts, email bursting, scheduled report production
- Mashup within applications and in processes

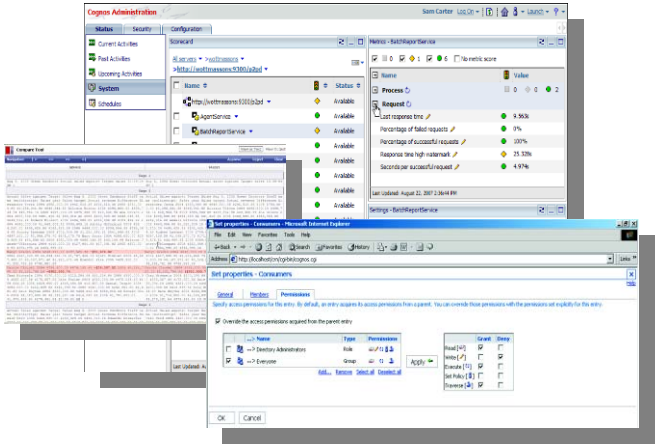
Deploy and Manage your BA environment

Model Information Services



- Deliver information in terms business understands
- Combine data into a single view across multiple disparate sources, including OLAP and relational
- Optimize models with built-in advisor, impact analysis, and integration with 3rd party metadata
- Easily manage multi-lingual, multi-tier models with reusable objects, versioning and retargeting
- Flexibly deploy model packages to deliver relevant views securely to different communities

Administer the Deployment



- Complete view of system activity
- Task-oriented system monitoring
- Integration with 3rd party EMS
- Proactive administration before business impact
- Comprehensive security down to data layer
- Visual upgrade with automated environment validation

The Top 10 of Cognos 10

1. **Unified workspace** with greater power, intuitive navigation and cleaner look
2. **Breadth of analytics** across historical, real-time and predictive information
3. **Collaborative BI** through built-in collaboration and social networking
4. **Easy data inclusion** by the business from one value, to entire data sets and external files
5. **Analytics on the go** for more devices and disconnected interaction
6. **Faster performance** with in-memory processing
7. **Seamless upgrade** and ease of ongoing management
8. **Trusted expertise** with built-in training videos, ‘how-to’ books and user communities
9. **Expanded deployment options** include Cloud**,** System z, and Power
10. **Cognos 10 Ready added value** of TM1, Planning, Analytic Applications and SPSS Modeler

Cognos working with CICS (in progress)

Re: CICS Events with Cognos Now! and Mashup Center

John Knutson to: Christopher Law, Mark Heid, Mike Biere

Cc: Klaus Roder, Mukul P Markande, Prakash Dewan, Sandeep K Tyagi

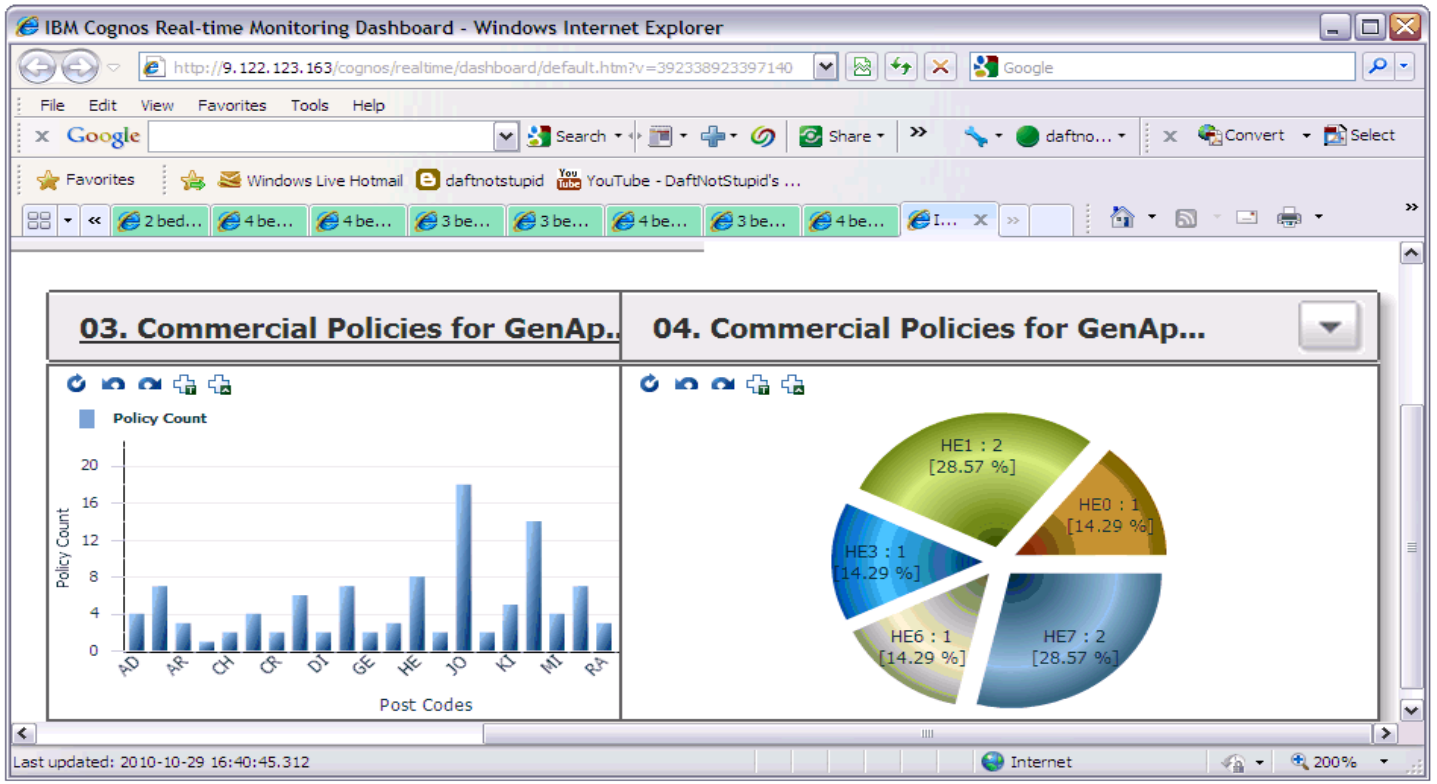
Default custom expiration date: 10/29/2011

10/29/2010

Sho

Me too. This looks very impressive.

Mike, Mark, The team is making pretty good progress. We've got CICS events showing up in Cognos Now! views and cubes now, and hopefully next week Klaus will be able to integrate them in Mashup Center and round-trip back to CICS. I'm now pretty confident that we have a good story to tell and demo when we record the webcast next Friday.



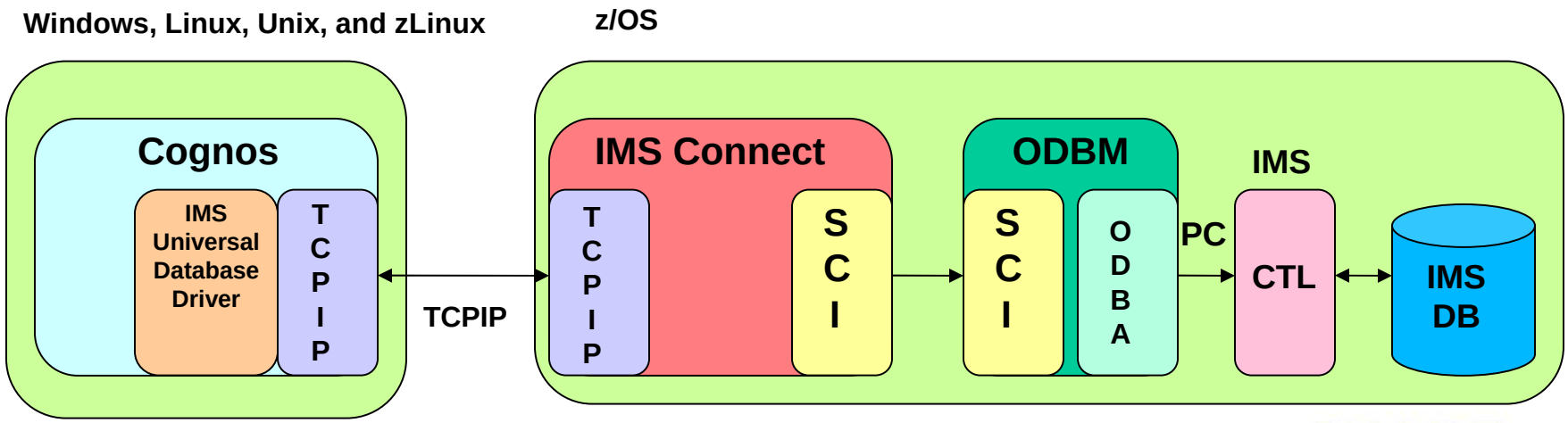
IMS Integration with Cognos

IMS V11 Open Database:

•IMS V11 allows distributed access over TCP/IP using the IMS Universal Database Driver (JDBC)

•IMS Connect and Open Database Manager now work together as a DRDA server for IMS data

- Shipped with IMS V11 – requires System Programmer for initial setup



Cognos 8 BI for Linux on System z

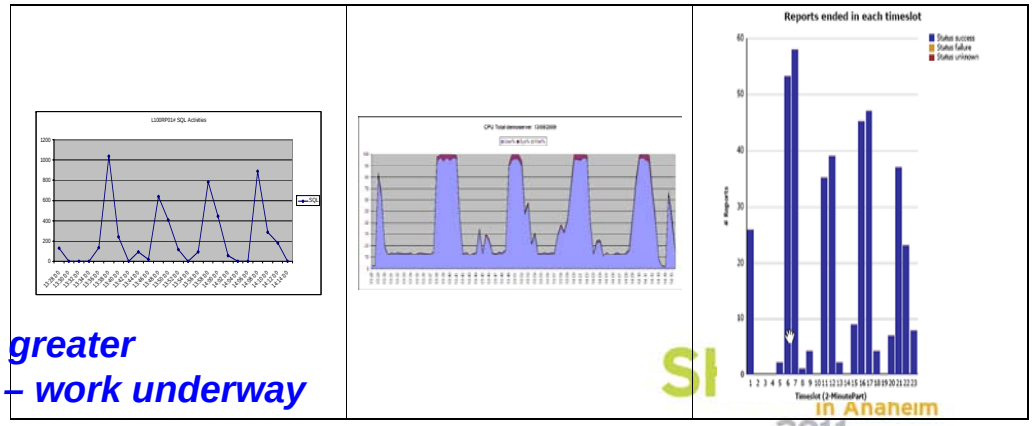
….Performance Testing

- Customer provided the need:
  - Processes operational and financial data for 10.000 other companies and exchanges info with 250 B2B partners.
  - Faced with performance & stability issues and could not expand it's BI any further.
- IBM Provided the Test Infrastructure:
  - Cognos 8 BI v3 and Websphere set-up on a zLinux and a DB2 instance on z/OS.
- Numius Provided the Expertise:
  - Ported existing application from the distributed to System z:
    - Cognos 8 BI
    - Oracle on HP-UX to DB2 on z/OS
    - MS-SQL on Wintel to DB2 on zLinux)
    - MS-IIS on Wintel to WebSphere on zLinux).
- Cognos Provided the Flexibility:
  - Cognos 8 BI - open to Operating Systems and Database Systems, no redevelopment was required

The Results

Cognos 8 BI for Linux on System z

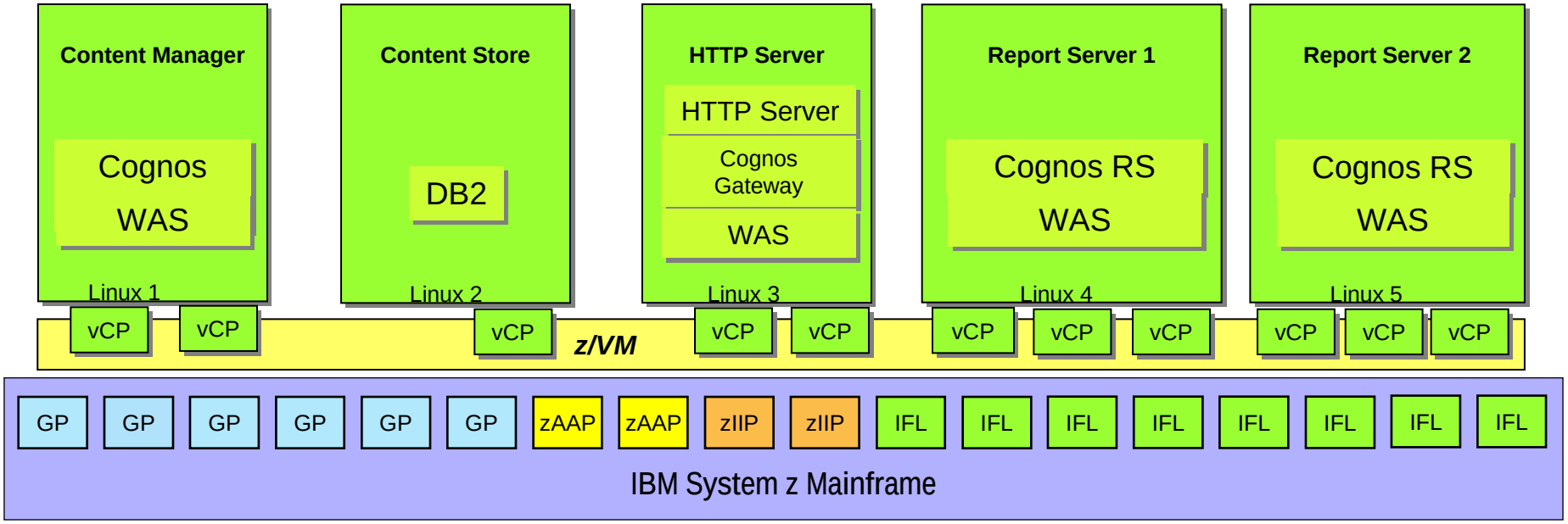
- By adhering to our best practises could support more users and deliver faster performance.
- There was no change in functionality at the Cognos 8 BI level, so no impact whatsoever for the end-user.
- Not one report timed out, not one user was rejected. Even when the system slowed down, it remained stable.
- No redesign was needed to achieve his objective of reaching out to a large community.
- ***System z was 400x faster in this case!!!***



Cognos 10 is showing even greater improvements on System z – work underway

IBM Cognos 8 BI within a z/VM environment

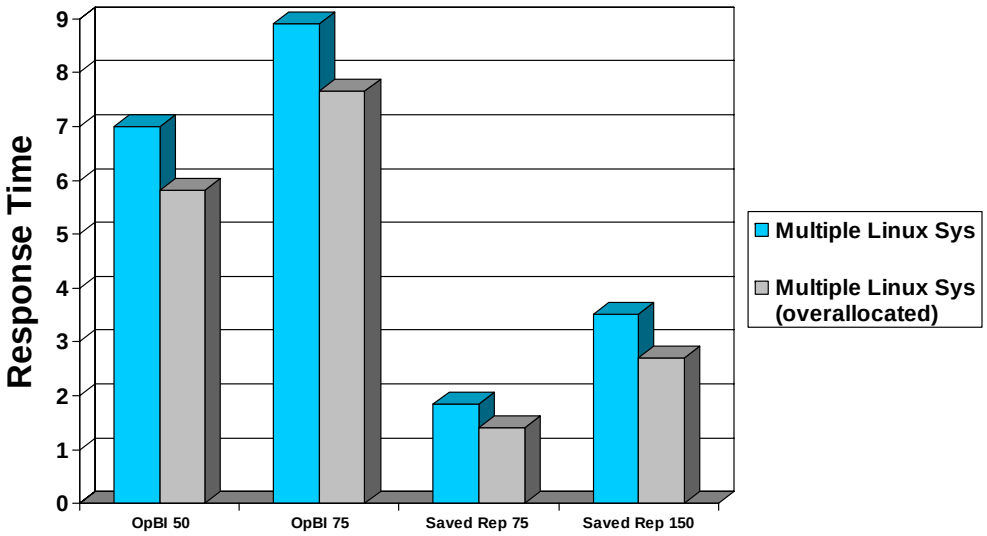
"Distributed" Deployment with Over-commit



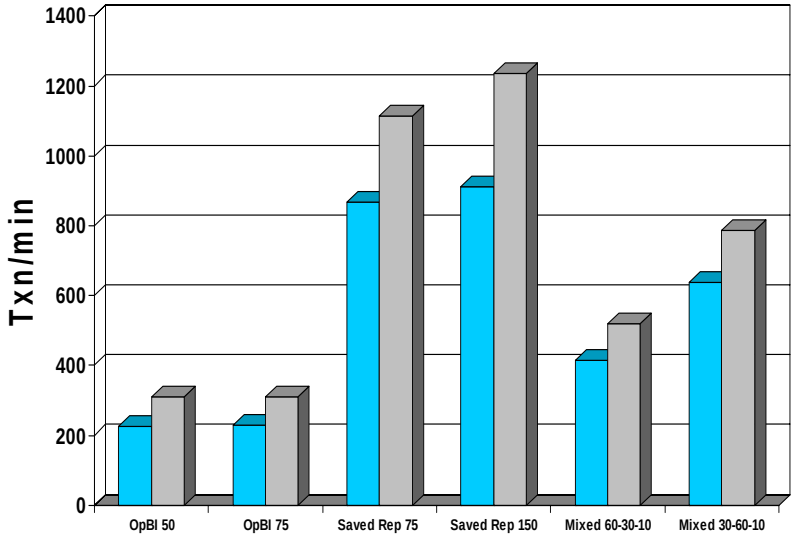
- Total allocation of **real IFLs** to z/VM remains the same **= 8**
- Number of virtual Cognos instances similar to other platforms' physical servers or partitions
- Individual Cognos components distributed on individual Linux "guest" servers
- Number of virtual CPs /Cognos **= 11** : instance increased on high CPU instances to enable use of excess capacity from low CPU instances
- Number of virtual CPs/Cognos instance should be less than or equal to number of GPs/IFLs assigned to z/VM LPAR
- Over-commit ratio (sum of virtual resource type/real resource type assigned to z/VM LPAR) varies from 1.5/1 to 20/1 or more – highly dependent upon how active the guest server is

Multiple Linux systems
– virtualization with CPU over-allocation

Avg. txn duration (lower is better)



Throughput (txn/min) (higher is better)



- With additional virtual CPU capacity available to the Report Server and HTTP Server, response times were lowered, and more transactions could be processed.

IBM's Blue Insight

In the spotlight

*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

IBM's Pains:

- Segmented investments in BI tooling and infrastructure
- Silo'd development, redundant and possibly competing
- Lack of tooling standardization
- Limited visibility to the total cost of business intelligence costs for the enterprise
- Organizational reluctance to a centralized service

IBM's Strategy:

- Common BI "appliance like" service for delivering BI to IBM
- Common service definition and boarding process
- Business intelligence experts to assist adopters
- Start with BI, grow to:
  - Predictive Analytics
  - Data Warehouse

IBM's Results:

- Consolidating 115 multi-product, departmental BI deployments to 1 Cognos 8 BI on System z
- Support for our global workforce
  - 2009 – 72K
  - 2010 – 130K
  - 2011 – 200K
- Realizing value from +60 data sources across IBM
- Projected $25M in savings
  - 60% Consolidation
  - 35% Standardization
  - 5% Automation

Learn more: ibm.com/software/systemz/telecon/1jun

What Exactly is Blue Insight?

Transformational technology delivery matched with process and solution delivery model changes

- **Common BI "appliance like" service for delivering Business Intelligence to IBM**
  - Common extensible infrastructure (HW & SW)
  - Common operational support
  - Common management of Cognos 8 BI *licensing* and Level 3 *support*
- **Common service definition and boarding process**
  - Defined BI tooling service scope (Reports, Adhoc, cubing, pervasive, etc)
  - Defined standard security and LDAP management
  - Common operational processes
- **Business intelligence experts to assist adopters**
  - BICC - (Business Intelligence Center of Competence)
  - Consultants available to assist in solution definition and consumption of service
- **Blue Insight is NOT an enterprise data strategy or a portal strategy**
  - Assumes data consumed by reports is a trusted part of the enterprise data strategy
  - Initial scope of Blue Insight was to use the standard Cognos portal delivery

Initial Business case
> $25M Savings over 5 years…

VIRTUALIZATION + STANDARDIZATION + AUTOMATION

- Business case categorization
  - Infrastructure
  - Operations
  - Skill efficiency

Z10 Infrastructure	Common service definition	Web 2.0 Boarding application
Shared peripheral infrastructure	Common security	Automated choreography & administration
Shared middleware	Common promotion process	Predictive planning
Shared Cognos V8	Common operations process	Automated provisioning
60% •HW Consolidations •SW Costs •3rd Party vendor savings	35% •Operations efficiency •Development efficiency •Improved time to value	5% •Adopter administration * - Future focus

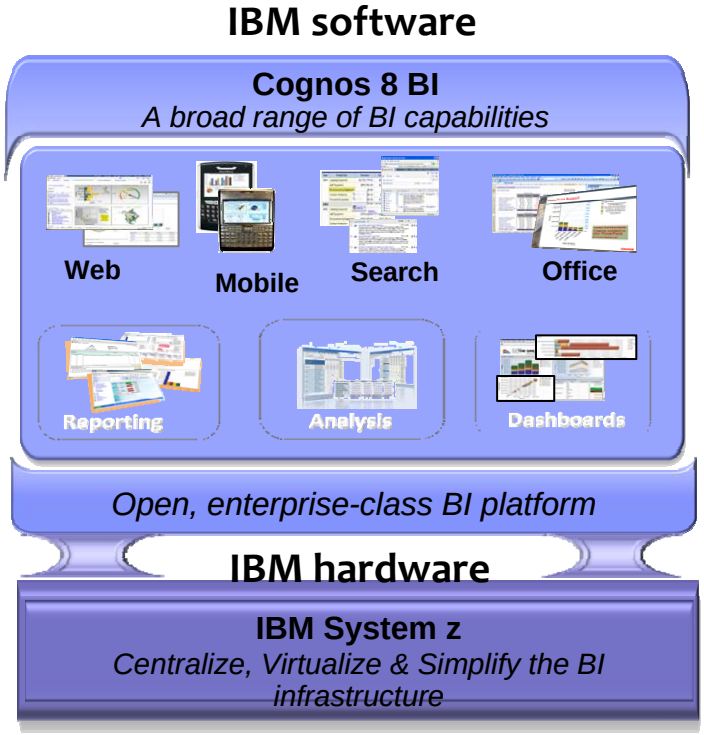
= Reduced Cost + Increased Flexibility

The Smart Analytics Cloud solution offering

Creates … *That delivers …*

Smart Analytics Cloud	A private cloud within the enterprise	A solution for delivering business intelligence to the entire organization

The solution components …

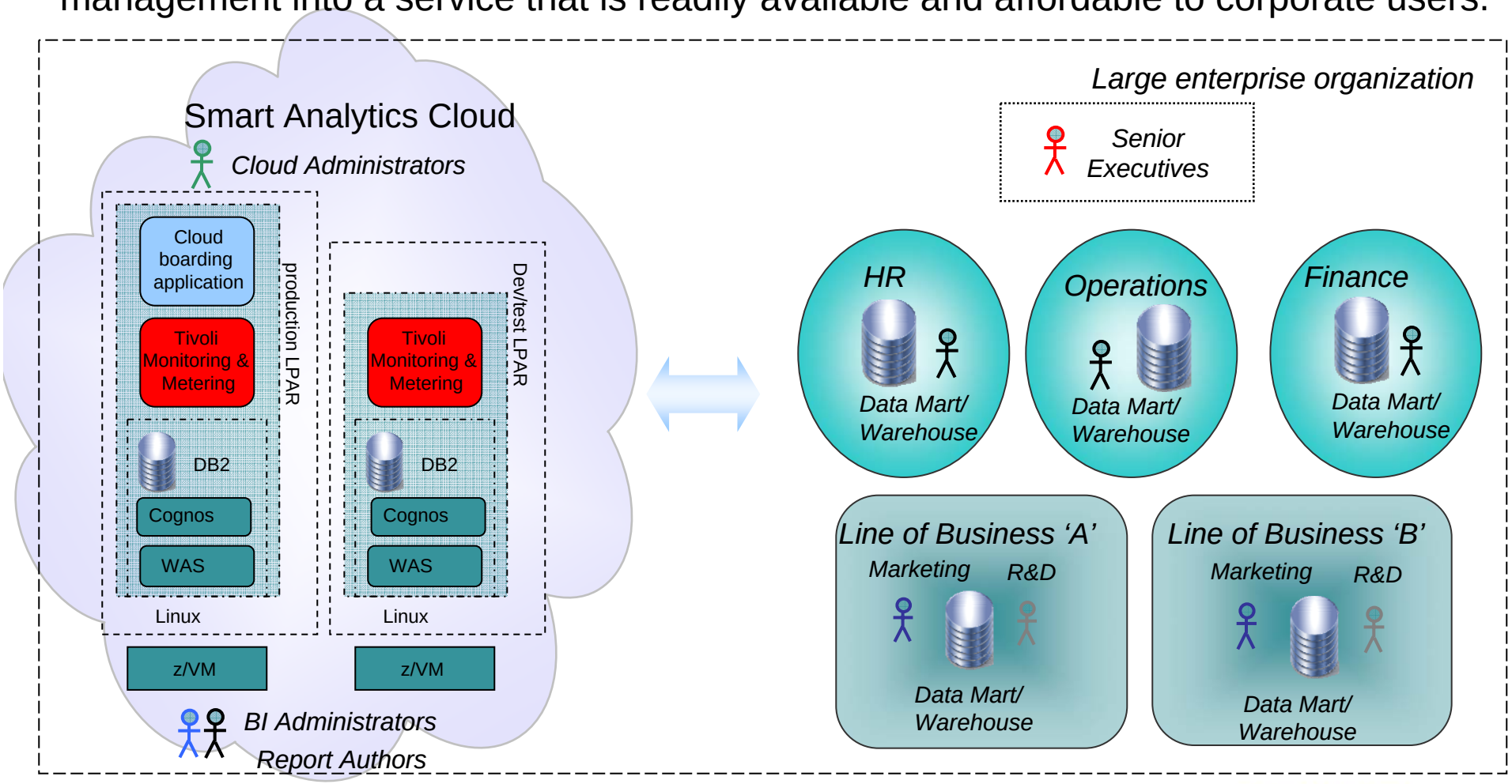


IBM Services

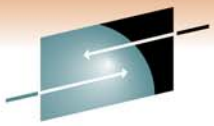
- **Phase 1**: Create awareness of, a strategy for and a governance foundation for BI across the organization
- **Phase 2**: Preparation for the Smart Analytics Cloud
- **Phase 3:** Install the base cloud, integrate into the corporate enterprise and test the cloud use cases
- **Phase 4:** Educate the enterprise for on-going success with the Smart Analytics Cloud

Smart Analytics Cloud is optimized for the enterprise

This offering transforms the delivery of business intelligence and performance management into a service that is readily available and affordable to corporate users.



View the demo: http://ibmurl.hursley.ibm.com/JQ4



SPSS Solutions - Modeler

Predictive Analytics

Predictive Analytics helps connect data to effective action by drawing reliable conclusions about current conditions and future events.

— Gareth Herschel, Research Director, Gartner Group

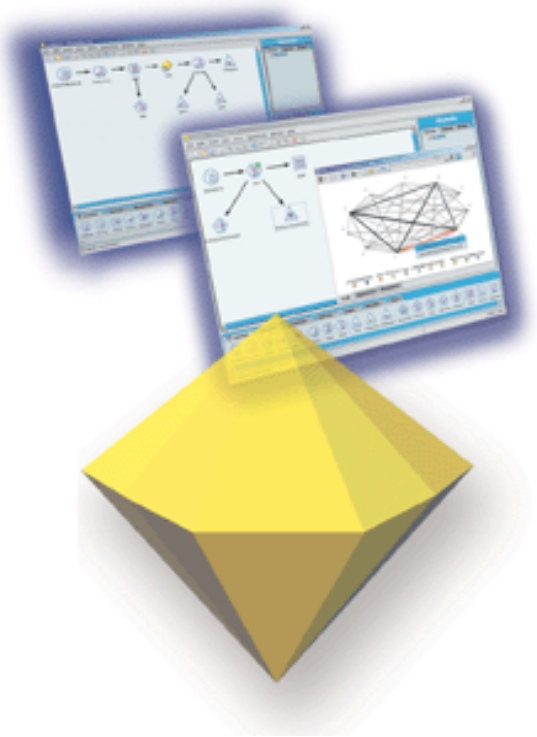
Predictive analytics

From Wikipedia, the free encyclopedia

Predictive analytics encompasses a variety of techniques from statistics, data mining and game theory that analyze current and historical facts to make predictions about future events.

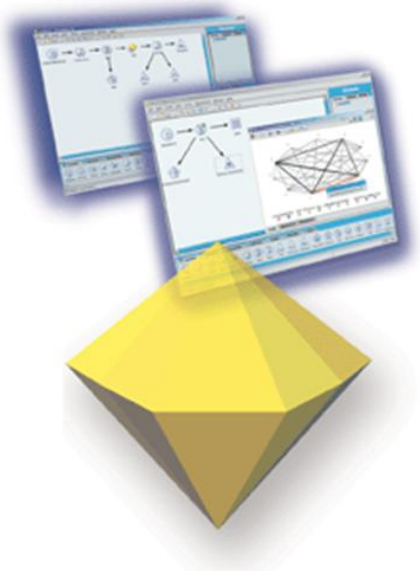
In business, predictive models exploit patterns found in historical and transactional data to identify risks and opportunities. Models capture relationships among many factors to allow assessment of risk or potential associated with a particular set of conditions, guiding decision making for candidate transactions.

Predictive Analytics with Modeler



- Data mining uses existing data to:
  - Predict
    - Category membership
    - Numeric Value
  - Group / Find Outliers
    - Cluster (group) things together based on their characteristics/attributes
  - Associate
    - Find events that occur together
  - Sequence
    - Forecasting/ Time-dependent events

Modeler Key Features

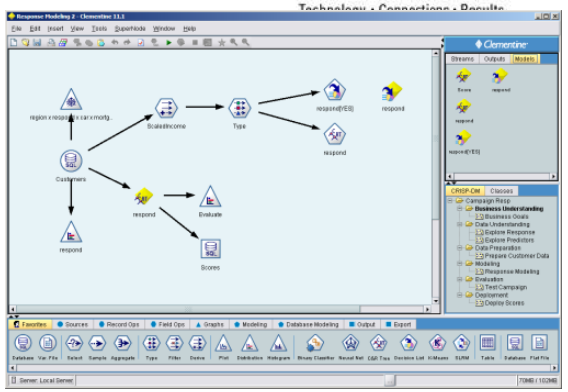


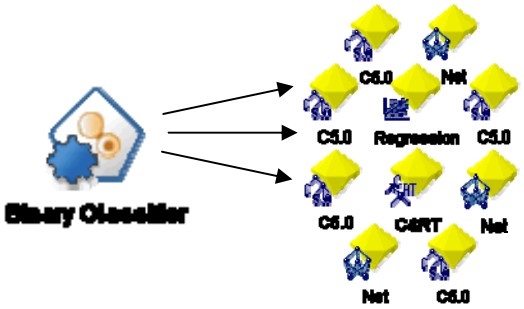
- Ease of use
- Openness
- Productivity
- Automatic Model Selection
- Powerful Data Manipulation/Transformation Functionality
- Multiple Levels of Model Deployment
- Very Scalable*
- Leverages existing database functionality*
  - SQL Pushback
  - *In-Database* Mining

*Server

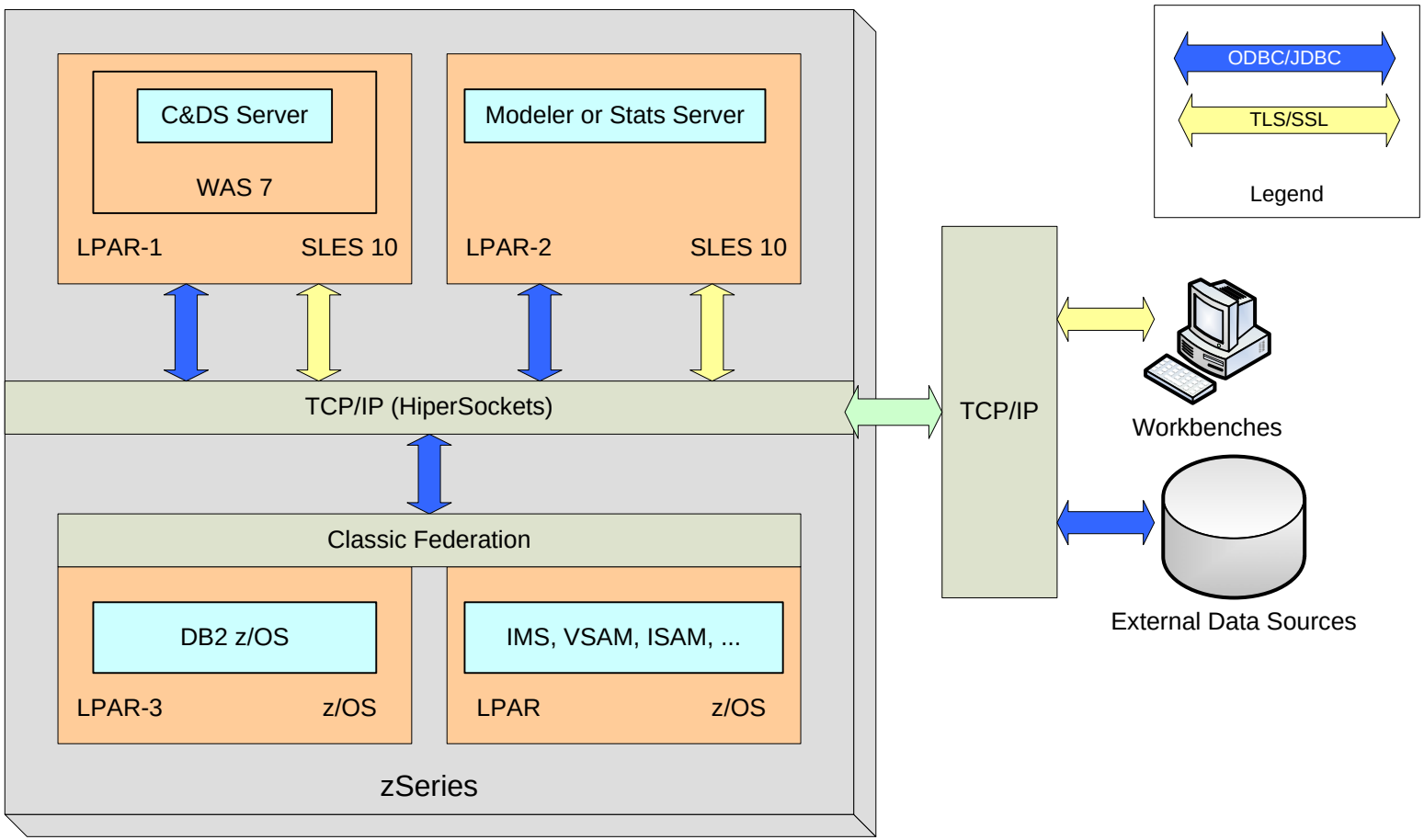
Customers use Modeler when they want to…

- Integrate and analyze data from a range of data sources
- Apply complex pre-/post-processing steps
- **Build and evaluate predictive models**
- **Perform advanced "predictive" analysis for deep insight e.g. segmentations, sequence detection, anomaly detection**
- Score cases in an ad hoc or straightforward batch manner
- Create predictive models and results for deployment through other products
- Enable all of the above in a way that is:
  - intuitive
  - accessible to users without "expert" credentials
  - supports the most demanding requirements of advanced users
  - minimizes time taken to deliver a best-fit solution





SPSS on System z



Summary

- IBM has heard you and responded
  - Information Server
  - InfoSphere Warehouse
  - Cognos 8 BI for Linux on System z
  - Cognos Now! for Linux on System z
  - Smart Analytics Optimizer
  - Smart Analytics Cloud
  - ISAS 9600
  - SPSS
- We have invested billions in new technologies and building a new information-led infrastructure
- BI has evolved from a static, report-centric environment to a more real-time and embedded analytics model – ***Business Analytics***
- Data Warehousing has evolved to a more global, federated, real-time environment
- We are using our own technology to change our business

SHARE in Anaheim 2011

External Websites

IBM Smart Analytics System 9600 Webpage:
http://www.ibm.com/software/data/infosphere/smart-analytics-system/

IBM Smart Analytics System Optimizer Webpage:
http://www.ibm.com/software/data/infosphere/smart-analytics-optimizer-z/

Data Warehousing and Analytics
http://www.ibm.com/software/data/infosphere/data-warehousing/

Data Warehousing and Business Intelligence on System z
http://www.ibm.com/software/data/businessintelligence/systemz/

Terabyte Club for System z BI customers
http://www.ibm.com/software/data/businessintelligence/systemz/terabyte-club.html

Data Governance on System z
http://www.ibm.com/software/data/db2imstools/solutions/compliance.html