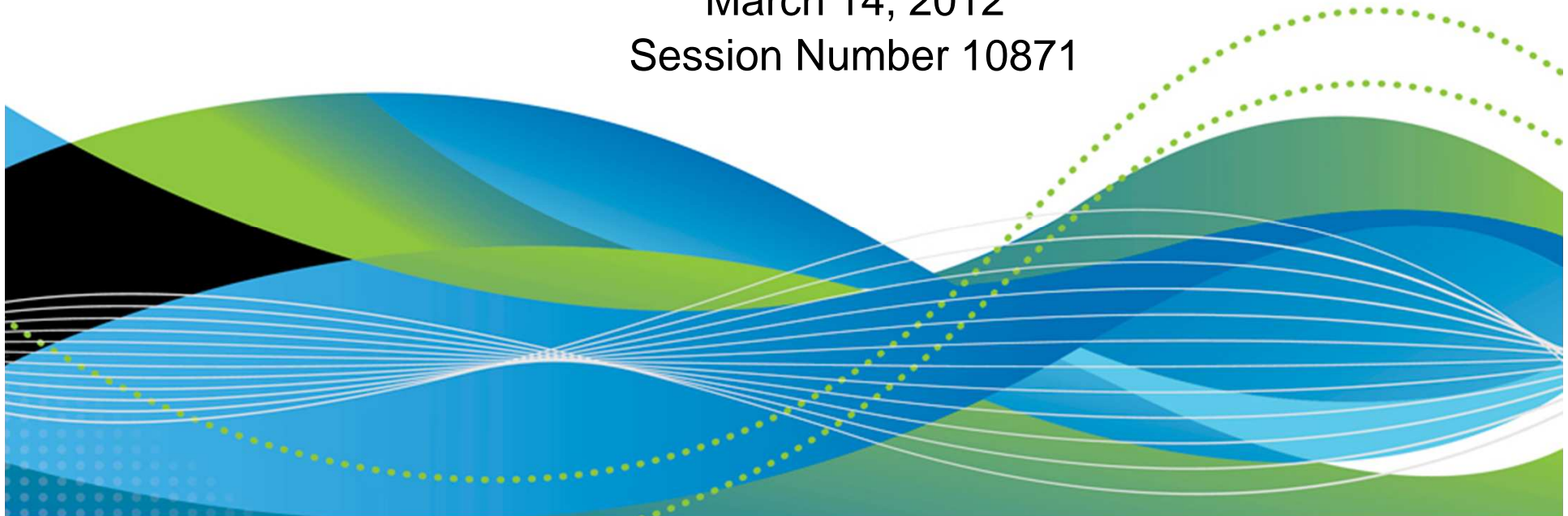


IBM's Business Intelligence (BI) and Analytics Update

Mike Biere
IBM Sr. Technology Consultant

March 14, 2012
Session Number 10871

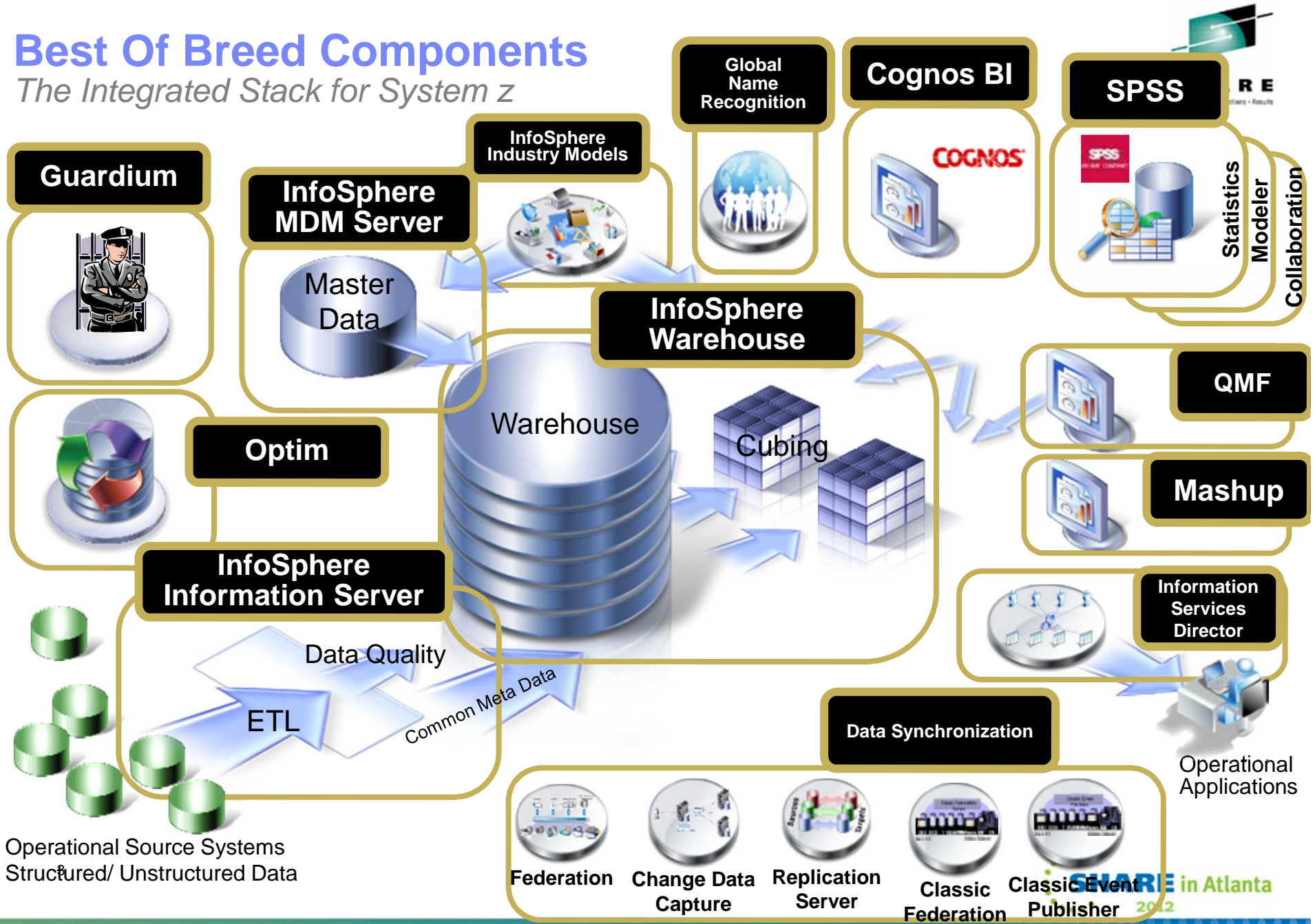


Agenda

- Business Analytics offerings
 - IBM Cognos 10 BI for Linux on System z *
 - IBM Cognos 8 BO for z/OS *
 - SPSS *
 - IBM QMF 10 *
- Supportive and acquisition software for analytics
 - DB2 10 for z/OS
 - IBM DB2 Analytics Accelerator (IDAA) *
 - DemandTec - application for retailers and consumer products companies
 - Emptoris - strategic supply and contract management software solutions

Best Of Breed Components

The Integrated Stack for System z



Delivers an
end-to-end
solution on a
single platform

IBM Cognos Business Intelligence for Linux on System z



- **Full range of BI capabilities**
 - Query, reporting, analysis, dashboarding, realtime monitoring
- **Delivers information where, when and how it is needed**
 - Self-service reporting and analysis
 - Automated delivery of information in context
 - Author once, consume anywhere
- **Purpose-built SOA platform**
 - Fits client environments and scales easily

Delivers an end-to-end solution on a single platform

IBM Cognos 8 Business Intelligence for z/OS



- Enables more users to make better, faster decisions
 - Offers BI capabilities for all user communities to receive relevant information how, when and where it is needed
 - Provides an open enterprise-class platform for IT to cost-effectively scale to meet growing user demands
 - Leverages the power of z/OS for continuous, high-volume operation with high security and stability



Query



Reporting



Analysis

IBM Cognos 8.4.1 BI for z/OS Conformance

Product Capabilities

- Report Studio
- Analysis Studio
- Query Studio
- Event Studio
- Framework Manager
- Transformer
 - Building of a Powercube for multi-dimensional reporting/analysis
- Not supported
 - Cubing Services
 - TM1 Client Support
 - Go! Dashboard
 - Go! Mobile
 - Go! Search
 - Virtual View Manager (VVM)

Initial Conformance

- | | |
|---------------------------|--|
| Hardware: | <ul style="list-style-type: none"> ▪ IBM System z9 or newer |
| Operating System | <ul style="list-style-type: none"> ▪ z/OS 1.10 ▪ z/OS 1.11 |
| Database Support | <ul style="list-style-type: none"> ▪ DB2 10 for z/OS ▪ DB2 z/OS Version 9 ▪ DB2 z/OS Version 8 ▪ Cognos 8 Powercubes |
| Application Server | <ul style="list-style-type: none"> ▪ WebSphere Application Server 7 (64-bit only) ▪ Tomcat 4.5 |
| Content Store | <ul style="list-style-type: none"> ▪ DB2 z/OS Version 8 ▪ DB2 z/OS Version 9 ▪ DB2 10 for z/OS |
| Directory Server | <ul style="list-style-type: none"> ▪ LDAP version 3 compliant server ▪ Tivoli Directory Server 5.2/6.0 |
| Web Server | <ul style="list-style-type: none"> ▪ IBM HTTP Server 7.0 |

IBM Cognos BI v10.1 for Linux on System z



Product Capabilities

- Query and Reporting
 - Analysis
 - Dashboarding
 - Real-time Monitoring
 - Cognos Mobile
 - Cognos Active Report
 - Cognos for Microsoft Office
 - Cognos Business Insight
 - Collaborative BI
-
- Not Supported:
 - Cognos Mash-up Service
 - Scorecarding
 - Statistics - (integrated solution – SPSS 19 is supported but not integrated through Cognos BI for Linux on System z)
 - Planning & Forecasting

Initial Conformance

Operating System

- SUSE 10, 11
- Red Hat 4, 5

Database Support

- DB2 z/OS 8.1, 9.1
- DB2 LUW 9.5, 9.7
- Oracle 10 R2
- Oracle 11 R1, R2
- InfoSphere Warehouse Cubing Services 9.5.2
- InfoSphere Federation Server 9.5
- Power Cubes
- SAP BW

Application Server

- Apache tomcat
- Websphere 6.1 (31-bit, 64-bit)
- Websphere 7.0 (31-bit, 64-bit)

Content Store

- Derby
- DB2 LUW 9.5. 9.7
- DB2 z/OS 8.1, 9.1
- Oracle 10 R2
- Oracle 11 R1, R2

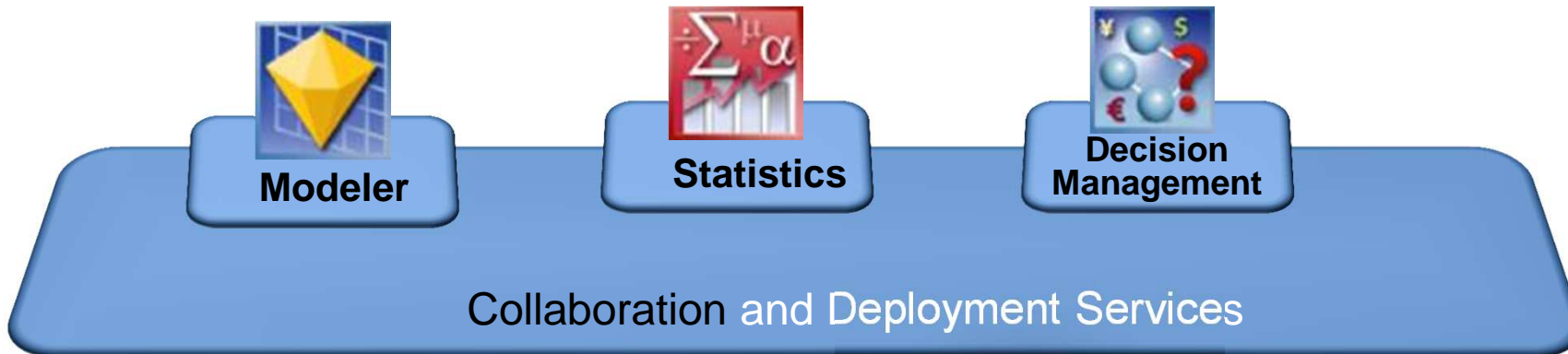
Directory Server

- IBM Tivoli 6.0
- LDAP version 3 compliant server

Web Server

- IHS 6.0, 6.1 and 7.0

SPSS for Linux on System z



IBM Capacity Management for System z



- **Effective cost control and management**

- Determine & monitor production capacity
- System utilization
 - Operating System & sub systems
- Monitor application usage
- Charge backs
- Maintain service level agreements



- **Predictable planning for growth**

- What if scenario modeling
- Impact of
 - Application standardization
 - Server consolidation
- Upgrade predictability
- Incremental application growth
- Facilitate orderly growth



- **Support emerging trends**

- Enterprise Cloud Computing
 - Predict the impacts of User On-boarding
- Business Analytics solution management

IBM Capacity Management Solution – More Detail



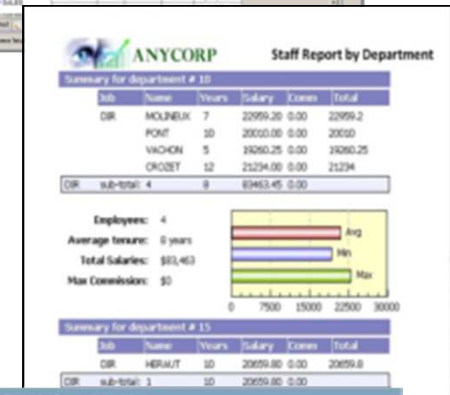
- IBM solution involves four parts:
 - Extractor to read, parse, and rationalize SMF data to replace SAS/MXG (MICS)
 - Repository to hold the normalized data to replace SAS data sets
 - Reporting engine to replace the current SAS programmed reports.
 - *Simulation and analytics engines* to
 - (1) optimize performance level
 - (2) Provide forecasting of future performance based on historical data
- Those parts will be satisfied as follows:
 - Tivoli Decision Support for system Z (TDSz) to read, normalize, and store data
 - DB2 on zOS (DB2) will serve as the repository for the data
 - The Cognos 10 Business Intelligence, (C10), reporting engine will be the reporting platform
 - SPSS Predictive Analytics will perform predictive analytics at the application level and integrate with Cognos BI.
 - Pre-built standard reports (to be available)
- Software Services to install, configure and build additional reports

QMF – Technology and business benefits



- DRDA to any DB2 (no middleware required)
- JDBC data access to Oracle, Sybase, SQL Server, Informix ... other JDBC
- IMS access (V11+) via JDBC
- 150+ Advanced analytic functions and analysis methods added
- Dashboards
- Graphical queries and reports
- Multi-dimensional analysis and OLAP support
- Heterogeneous (federated) database access and 'virtual' data source support
- Mobile device support (iPad, Android, etc.)
- Embeddable applications
- Integration with other solutions e.g. SPSS
- ... and much more

EMPID	NAME	HIRING DATE	SALARY
1001	JAMES	1980-09-17	5120.00
1002	BLAKE	1981-05-01	2850.00
1003	CLARK	1981-06-07	2450.00
1004	ALLEN	1981-08-17	1900.00
1005	WARD	1981-05-12	1200.00
1006	MARTIN	1981-02-17	1250.00
1007	MANEY	1981-03-17	1200.00
1008	FRANK	1981-04-17	1700.00
1009	MCHENRY	1981-09-01	1700.00
1010	DEWNEY	1981-09-01	1800.00
1011	BURNETT	1981-03-24	2850.00
1012	CELTZ	1981-12-09	2850.00
1013	FRANKS	1982-01-31	3000.00
1014	TURNER	1982-03-15	3150.00
1015	BAER	1982-04-17	3300.00
1016	SPENCER	1982-05-23	3500.00
1017	PERCIVAL	1982-08-14	2800.00



QMF – Installation, Deployment, Administration



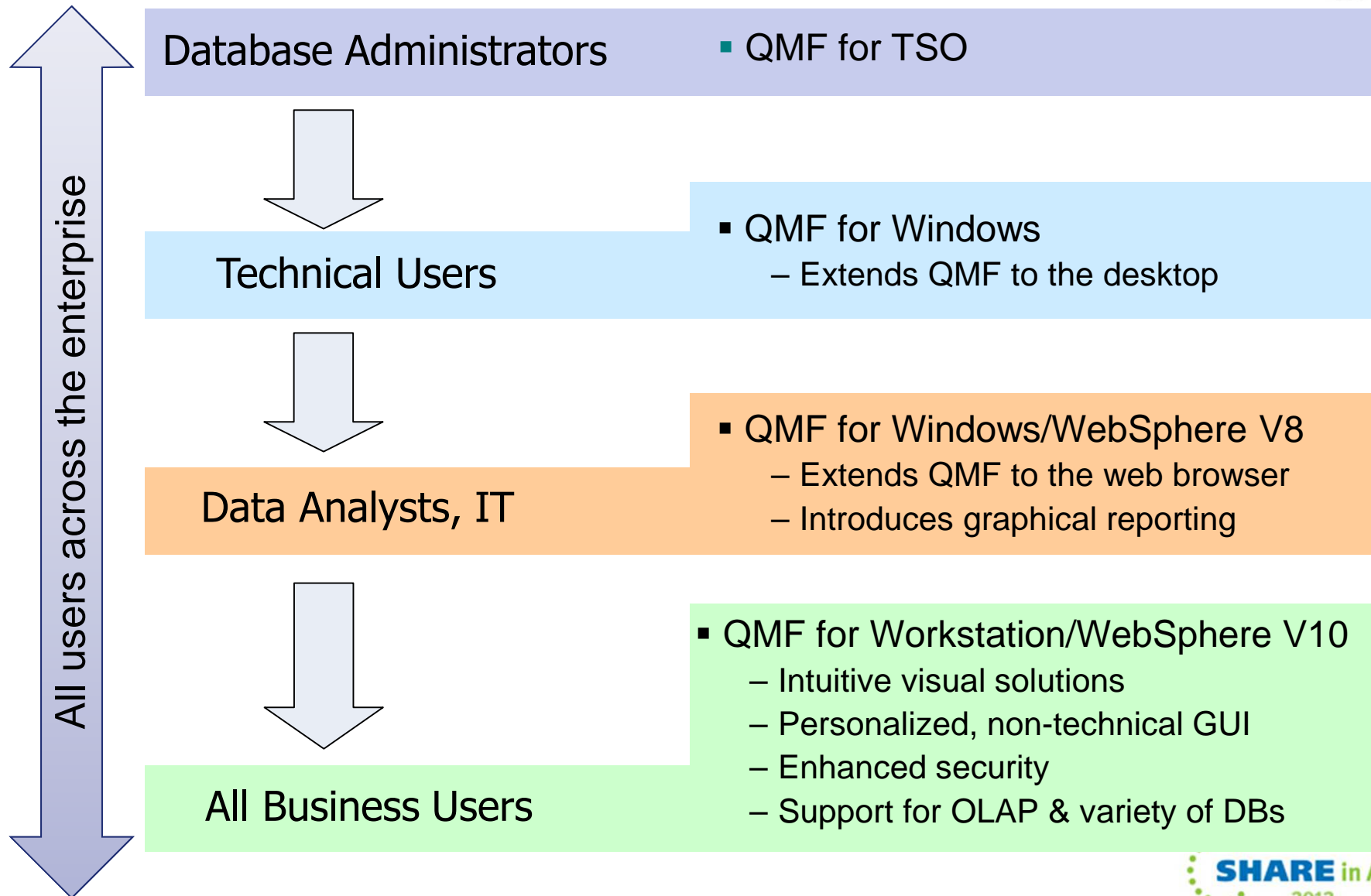
- QMF 10 provides an enterprise license model with no per-user cost.
- Cost based upon the DB2 for z/OS accessed but deployable on any platform ... at no additional cost
- QMF is simple to install & administer
 - Auto-deployed settings & centralized admin
 - Upgrading between versions requires zero migration – new versions work with existing content
 - New QMF customers are typically up and running within a couple of hours



QMF Enterprise Edition (QMF EE) Solution Suite

- The QMF product family comprises the following components:
 - **QMF for TSO/CICS:** Supports end-users who work entirely from traditional mainframe monitors to access databases in the IBM DB2 family
 - **QMF HPO:** ‘High Performance Option’ for QMF for TSO/CICS is a multifaceted tool that helps database administrators manage QMF objects and increase performance in the TSO and CICS environments
 - **QMF for Workstation:** Extends the key functionality of QMF for TSO/CICS on distributed platforms via a rich desktop development environment. Runs on Windows, Linux, and the Mac
 - **QMF for WebSphere:** Provides a feature set similar to that of QMF for Workstation, using a thin-client, browser-based solution. Runs on Windows, Linux, Solaris, AIX, HP-UX, iSeries, z/Linux, and z/OS

Evolution of Target User Base



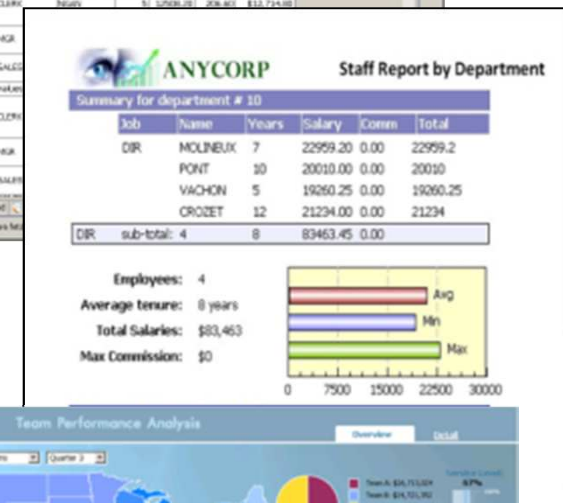
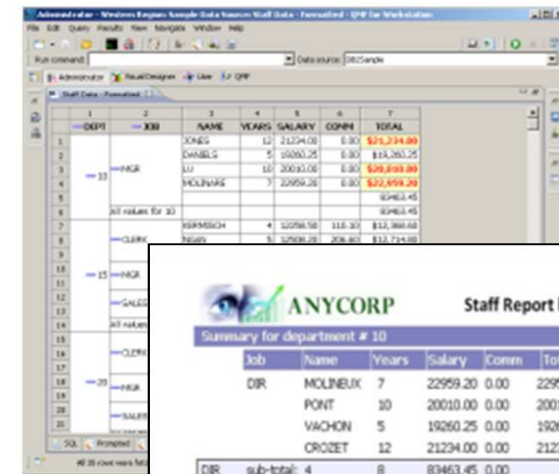
QMF EE Product Interoperability

- *QMF for TSO/CICS* users develop, edit and run QMF queries, forms, reports and procedures via the 3270 user interface. These QMF objects are stored in the QMF catalog.
- QMF for Workstation and WebSphere access the same QMF catalogs and use the very same object format
 - Queries, reports, procedures authored in QMF for TSO can be accessed, edited, and executed in QMF for Workstation and WebSphere and vice versa.
 - All changes made in one QMF product are immediately accessible in all other QMF products
- With QMF EE V10, users can also initiate the z/OS-based execution of QMF objects from the QMF for Workstation/WebSphere products

QMF V10 – a variety of content



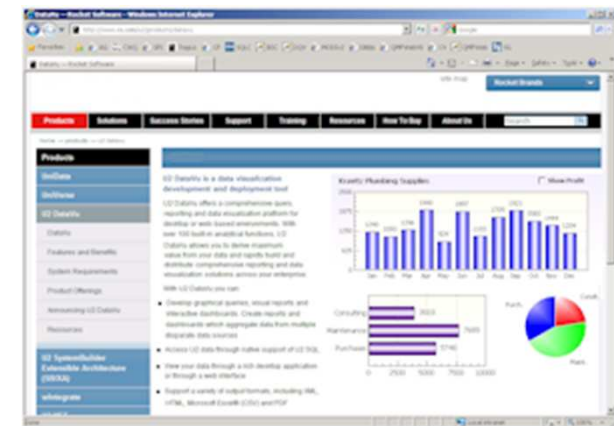
- Ad-hoc & prepared queries
 - Create/edit/re-use QMF queries
 - Apply groupings, aggregations and conditional formats
 - One-click export to Excel, data files or DB table
 - One-click generation of reports from the data
- Tabular and graphical reports
 - Generate QMF tabular reports or graphical *visual reports*
 - Highly customizable page-based layouts
 - Draw data from any number of data sources
- QMF Dashboards
 - Customized, interactive data visualizations
 - Rapid authoring model



Taking QMF to the Web

- QMF for WebSphere allows enterprises to disseminate queries, reports and dashboards to users across the enterprise
 - Create, run and share queries on the Web
 - Run and share reports on the Web
 - Deploy dashboards to business end users as stand-alone solutions or embedded within web pages and web applications

- Ability to render content in
 - Pure HTML & JavaScript*
 - Adobe Flash Player
 - PDF



* Suitable for all browsers and platforms

QMF V10 Dashboards

- Provides end users with direct access to enterprise data
- Highly customizable – provides the means to perfectly meet the needs of the end users
- Ability to aggregate data concurrently drawn from heterogeneous relational and OLAP sources
- Interactive, ad-hoc visualizations and optional data write-back
- Publish via the web or workstation



IARE
Connections • Results

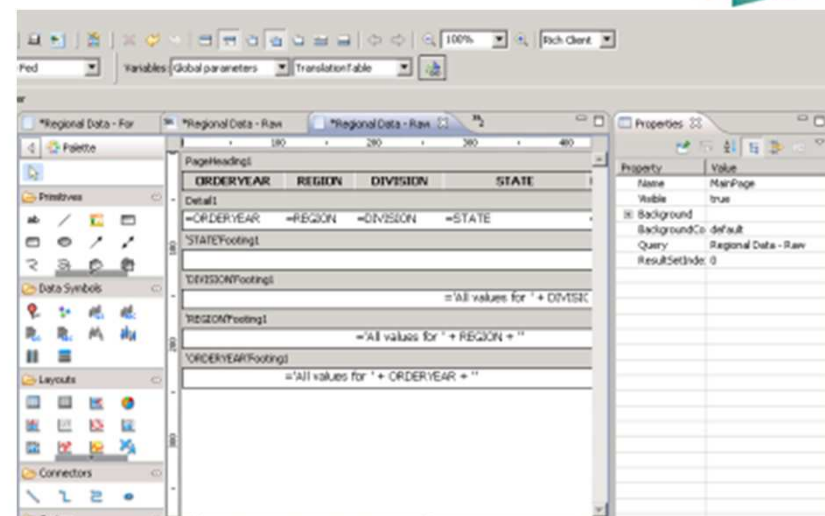
Additional Dashboard Features

- **All queries can be assigned ‘expiration schedules’**
 - Allows reports to cache data and only fetch it when it expires
 - Flexible schedules, such as ‘first Tues in month’ etc.
- **Support for localization**
 - QMF externalizes report and dashboard text that you add to it
 - Text can be loaded into string tables for supported locales
 - Dashboards automatically invoke the locale-specific string table
 - Dashboards and reports support DBCS, Unicode and RTL layouts
- **Optional dashboard security model**
 - Uses Active Directory, LDAP or a QMF-defined users/groups
 - Ability to tailor dashboard content, based on user’s access level
 - Apply access permissions on a per-dashboard basis



QMF V10 Visual Reports

- Generates HTML or PDF graphical reports, drawing data from one or more data sources
- Support for optional cover sheets, summary pages and report annexes
- Reports generated at designated intervals and made available to end users via the workstation, web or email
- Ability to directly embed reports within portals, custom web sites or web applications



>> Legal Exchange Invoice From Law Firm: Aler & Johnson

Invoice Number	10390895
Invoice Date	22/11/2003
Matter Number	377562
Matter Name	Jacob Muller vs Mathew Evans
Client Personnel	James Walker
Customer Pay	Y

> FEES:

Date	TK Name	Code	Hours	Rate	Org. Amt	Curr. Amt	Description
21/11/2003	Stephen Hall	L310	40.9	\$153.90	\$6,294.51	\$6,294.51	-
21/11/2003	William Harris	L310	61.3	\$184.70	\$11,322.11	\$11,322.11	-
Total Fees:					\$17,616.62	\$17,616.62	

> EXPENSES:

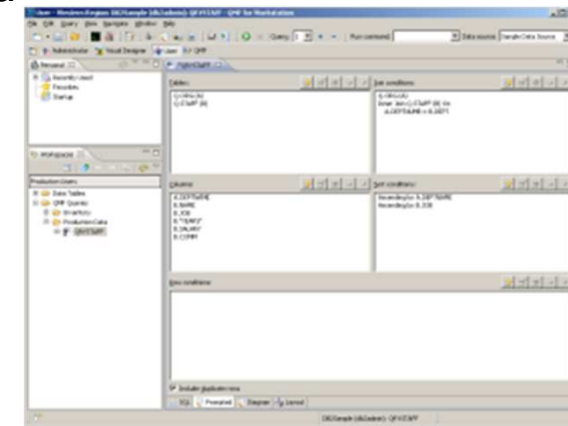
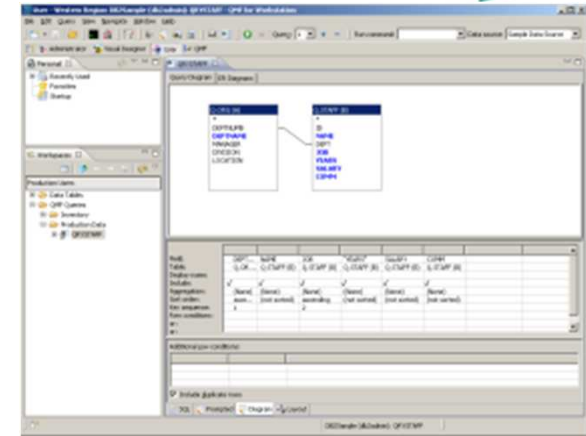
Date	TK Name	Code	Units	Cost	Org. Amt	Curr. Amt	Description
21/11/2003	Harold Wilson	E120	1	\$958.70	\$958.70	\$958.70	-
Total Expenses:					\$958.70	\$958.70	

> BILLING SUMMARY:

	Original Amount	Current Amount
Fees:	\$17,616.62	\$17,616.62
Expenses:	\$958.70	\$958.70
Totals:	\$18,575.32	\$18,575.32

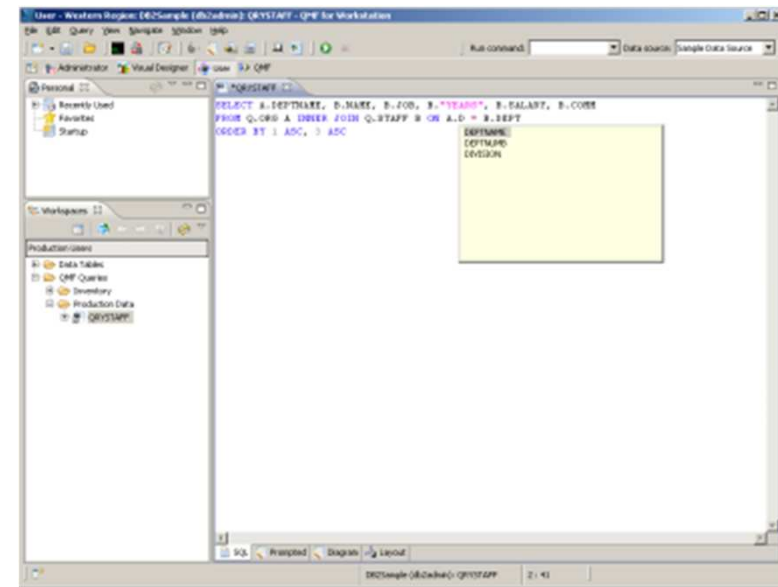
Query creation for the 'casual' end user

- Users can rapidly build and execute ad-hoc queries without SQL knowledge
- Graphical development via 'query diagram' designer
 - Users select from collections of pre-built diagrams (ERDs) defined by QMF admins
 - Define columns, conditions, aggregations and desired sorting options
- Step-by-step development via 'prompted query builder'
 - Methodically leads the user through the query development process
 - Separate panels handle each distinct aspect of the query (tables, columns etc.)
- Both facilities available in both the workstation and web user interfaces



Query creation for Power Users

- In addition to the query diagram and prompted query development facilities, power users can also directly edit query SQL via the web or workstation
- Full-featured, colorized SQL editor includes code assist, code completion and dynamic parameter hints, increasing development productivity
- Power users can move between the prompted, diagram and SQL views, refining a given query across all three editors
- For example, one might:
 - Define query tables by selecting elements from a pre-existing ERD
 - Add query conditions using the expression designer within the prompted query view
 - Add final refinements via the SQL editor (such as nested SQL or unions)



Metadata Layer Simplifies ad-hoc Analysis



- Create custom views of tables or sets of tables
- Alter table names, column names, add calculated columns, pre-joined views etc. without altering the physical structure of the underlying databases –creates a virtual view of underlying data sources
- End users access the ‘virtual’ tables – QMF translates their SQL to that which matches the underlying table schemas
- Shields users from the underlying complexity of database schemas.
- Permits DB schema changes that do not impact reports, dashboards, queries
- Ability to ‘point’ users to the correct DB2 etc. system with same query name such as Sales_Query ... will switch by user

Hot off the press!!

IBM, Information Management Software

Draft Document for Review January 25, 2012 5:44 pm

IBM

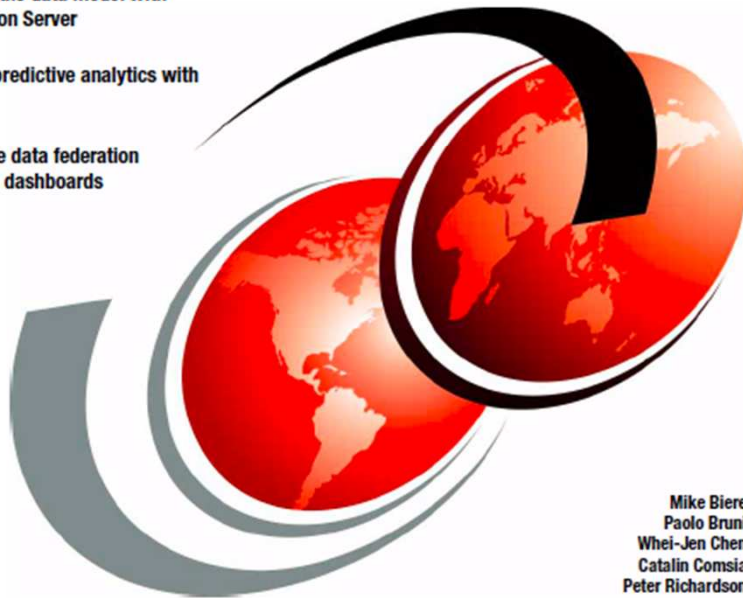
SG24-8012-00

Enterprise Business Intelligence and Reporting with IBM DB2 Query Management Facility 10 for z/OS

Populate the data model with Information Server

Perform predictive analytics with SPSS

Showcase data federation with QMF dashboards



Mike Biere
Paolo Bruni
Whei-Jen Chen
Catalin Comsia
Peter Richardson

Redbooks

ibm.com/redbooks

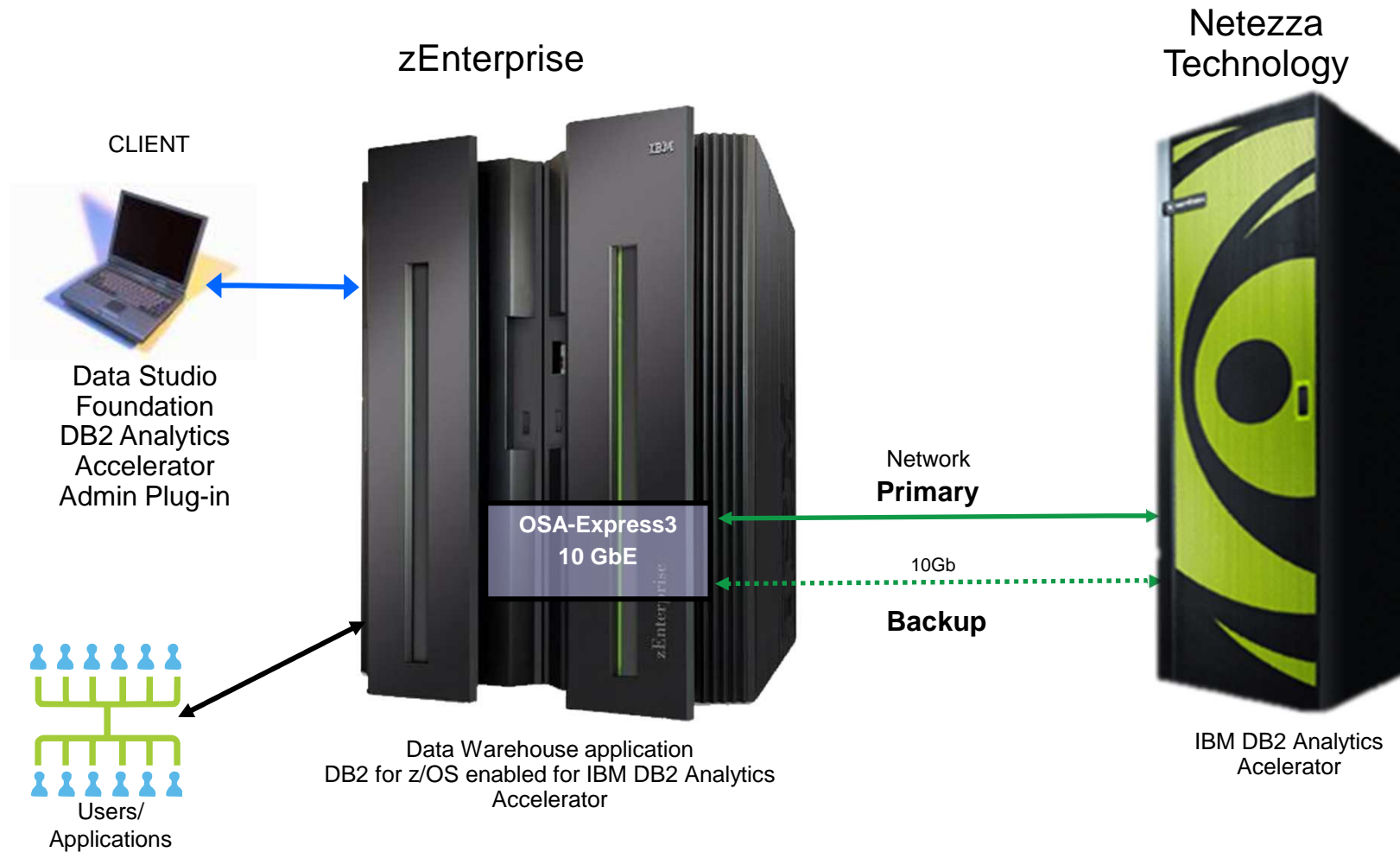


SG24 - 8012

- ✓ *QMF Family enhancements*
- ✓ *Dashboards*
- ✓ *Graphical queries and reports*
- ✓ *IDAA*
- ✓ *Metadata enhancements*
- ✓ *JDBC access examples*
- ✓ *Installation & Maintenance*
- ✓ *New hardware advantages*
- ✓ *DB2 10 for z/OS temporal support*
- ✓ *Mobile application support*
- ✓ *... and more*



IBM DB2 Analytics Accelerator V2 Product Components



Significant acceleration of certain queries 1000x+!!



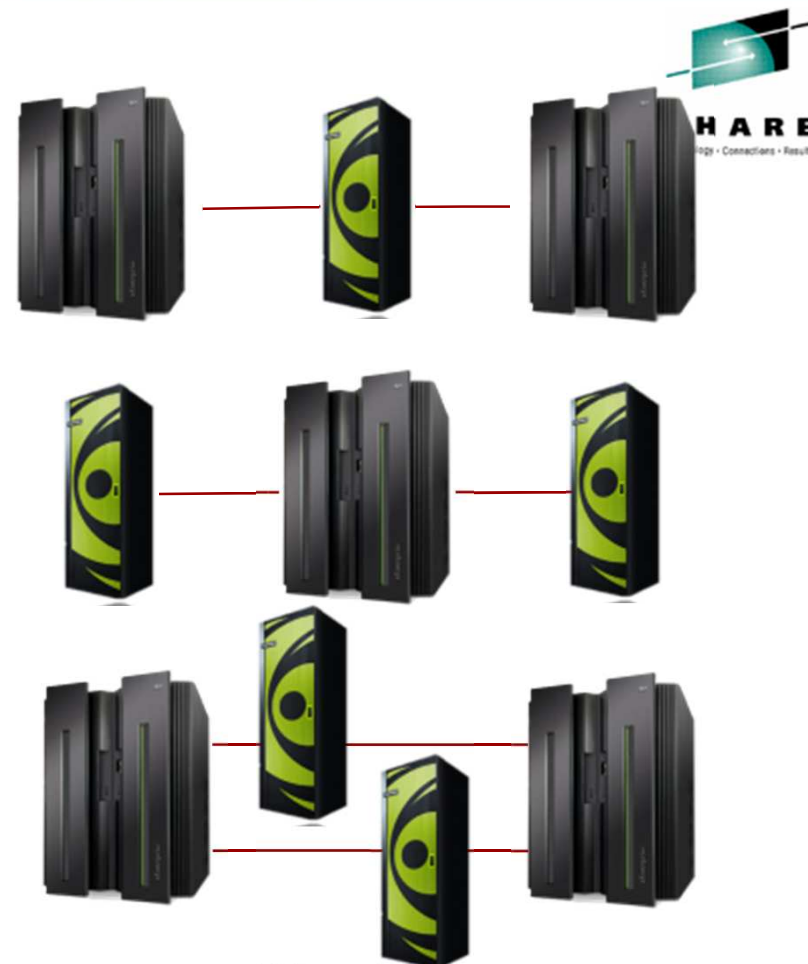
Connectivity Options

Multiple DB2 systems can connect to a single IDAA

A single DB2 system can connect to multiple IDAAs

Multiple DB2 systems can connect to multiple IDAAs

Better utilization of IDAA resources
Scalability
High availability



Full flexibility for DB2 systems:

- residing in the same LPAR
- residing in different LPARs
- residing in different CECs
- being independent (non-data sharing)
- belonging to the same data sharing group
- belonging to different data sharing groups

Performance & Savings



Query	Total Rows Reviewed	Total Rows Returned	DB2 Only		DB2 with IDAA		Times Faster
			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

Queries run faster

- Save CPU resources
- People time
- Business opportunities

Actual customer results, October 2011



DB2 Analytics Accelerator: “we had this up and running in days with queries that ran over 1000 times faster”



DB2 Analytics Accelerator: “we expect ROI in less than 4 months”

Accelerating decisions to the speed of business SHARE in Atlanta 2012

Free Workload Evaluation/Sizing

- Customer
 - Collecting information from dynamic statement cache, supported by step-by-step instruction and REXX script (small effort for customer)
 - Uploading compressed file (up to some MB) to IBM FTP server

- IBM / Center of Excellence
 - Importing data into local database
 - Quick analysis based on known DB2 Analytics Accelerator capabilities

IBM Smart Analytics Optimizer -- W
Center of Excellence, Datawarehouse on System z, IBM Res

Query Summary

	Total	With potential	Uncertain	W/o potential
Queries	23	11 (48%)	5 (22%)	7 (30%)
Query Blocks	23	11 (48%)	5 (22%)	7 (30%)
Elapsed Time	144801.47	106821.61 (74%)	8150.21 (6%)	29829.66 (21%)
CPU Time	21300.25	11420.12 (54%)	1453.14 (7%)	8426.98 (40%)

Queries	23	100%
... no eligible blocks	7	30%
... not read only	0	0%
... with very large dim.	1	4%
... with quant. pred.	0	0%


Leaf Query Blocks	23	100%
... with aggregations	23	100%
... with UDFs	0	0%
... with unsupported functions	6	26%
... with unsupported join types	0	0%
... with very large dimensions	1	4%

Start trace time: Apr 2, 2010 9:41 AM
End explain time: Apr 2, 2010 4:37 PM
Min stmt cached: Apr 2, 2010 9:44 AM
Max stmt cached: Apr 2, 2010 4:37 PM


Disclaimer: Information provided in this document is for information purposes only and does not guarantee characteristics nor imply supported features of IBM products. V20100331
Schema: IGBURG -- Date: 4/12/10 -- Page: 1

Report for a first assessment:

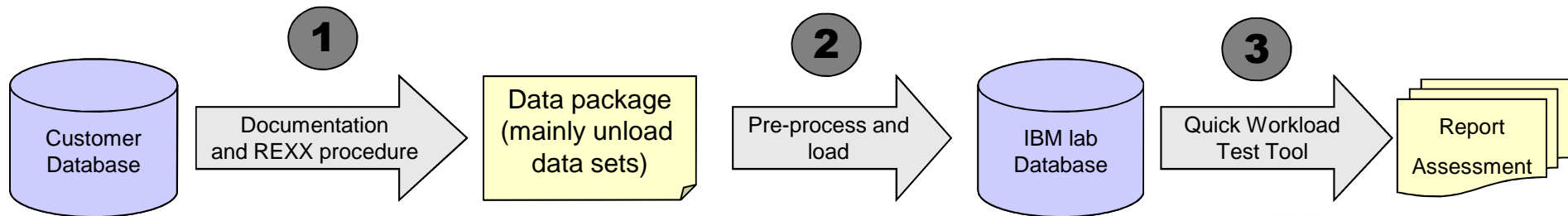
- Acceleration potential for
 - Queries
 - Estimated time
 - CP cost



Query blocks with acceleration potential
Query blocks with uncertain potential
Query blocks without acceleration potential



Elapsed time with acceleration potential
Elapsed time with uncertain potential
Elapsed time without acceleration potential



Live Product Walkthrough

Summary

- The IBM Business Analytics portfolio continues to evolve
- Established solutions such as QMF are getting significant attention and new function
- DB2 for z/OS gaining traction as the enterprise DW server
- IDAA performance well documented