IBM's Business Intelligence (BI) and Analytics Update

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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

* We will discuss these
Best Of Breed Components
The Integrated Stack for System z

- Guardium
- InfoSphere MDM Server
- Optim
- InfoSphere Information Server
- InfoSphere Industry Models
- Master Data
- Data Quality
- ETL
- Common Meta Data
- Operational Source Systems Structured/ Unstructured Data
- Warehouse
- Cube
- Cubing
- Data Synchronization
- Data Replication
- Federation
- Change Data Capture
- Replication Server
- Classic Federation
- Classic Publisher
- Global Name Recognition
- Cognos BI
- SPSS
- Statistics Modeler
- Collaboration
- QMF
- Mashup
- Information Services Director
- Operational Applications
- Global Name Recognition
- Master Data
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, real-time 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
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
**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:**
- IBM System z9 or newer

**Operating System:**
- z/OS 1.10
- z/OS 1.11

**Database Support:**
- DB2 10 for z/OS
- DB2 z/OS Version 9
- DB2 z/OS Version 8
- Cognos 8 Powercubes

**Application Server:**
- WebSphere Application Server 7 (64-bit only)
  - Tomcat 4.5

**Content Store:**
- DB2 z/OS Version 8
- DB2 z/OS Version 9
- DB2 10 for z/OS

**Directory Server:**
- LDAP version 3 compliant server
  - Tivoli Directory Server 5.2/6.0

**Web Server:**
- IBM HTTP Server 7.0
### 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

- Predictive Customer Analytics
  - Acquire
  - Grow
  - Retain

- Predictive Operational Analytics
  - Manage
  - Maintain
  - Maximize

- Predictive Threat & Risk Analytics
  - Monitor
  - Detect
  - Control

- Collaboration and Deployment Services

IBM Research

- Jrules (iLOG)
- IBM Research
- Etc
- QMF V10
- Cognos software
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
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

<table>
<thead>
<tr>
<th>All users across the enterprise</th>
<th>Database Administrators</th>
<th>Technical Users</th>
<th>Data Analysts, IT</th>
<th>All Business Users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>QMF for TSO</strong></td>
<td><strong>QMF for Windows</strong></td>
<td><strong>QMF for Windows/WebSphere V8</strong></td>
<td><strong>QMF for Workstation/WebSphere V10</strong></td>
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<td></td>
<td></td>
<td><strong>Extends QMF to the desktop</strong></td>
<td><strong>Extends QMF to the web browser</strong></td>
<td><strong>Intuitive visual solutions</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Personalized, non-technical GUI</strong></td>
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<td></td>
<td><strong>Enhanced security</strong></td>
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<td></td>
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<td></td>
<td><strong>Support for OLAP &amp; variety of DBs</strong></td>
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</tbody>
</table>
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
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
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!!

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

CLIENT

Data Studio Foundation
DB2 Analytics Accelerator Admin Plug-in

Data Warehouse application
DB2 for z/OS enabled for IBM DB2 Analytics Accelerator

OSA-Express3
10 GbE

zEnterprise

Network
Primary

10Gb
Backup

Netezza Technology

IBM DB2 Analytics Accelerator

Users/Applications

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

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

Better utilization of IDAA resources
Scalability
High availability
Performance & Savings

Queries run faster
- Save CPU resources
- People time
- Business opportunities

Actual customer results, October 2011

<table>
<thead>
<tr>
<th>Query</th>
<th>Total Rows Reviewed</th>
<th>Total Rows Returned</th>
<th>DB2 Only</th>
<th>DB2 with IDAA</th>
<th>Times Faster</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hours</td>
<td>Sec(s)</td>
<td>Hours</td>
</tr>
<tr>
<td>Query 1</td>
<td>2,813,571</td>
<td>853,320</td>
<td>2:39</td>
<td>9,540</td>
<td>0.0</td>
</tr>
<tr>
<td>Query 2</td>
<td>2,813,571</td>
<td>585,780</td>
<td>2:16</td>
<td>8,220</td>
<td>0.0</td>
</tr>
<tr>
<td>Query 3</td>
<td>8,260,214</td>
<td>274</td>
<td>1:16</td>
<td>4,560</td>
<td>0.0</td>
</tr>
<tr>
<td>Query 4</td>
<td>2,813,571</td>
<td>601,197</td>
<td>1:08</td>
<td>4,080</td>
<td>0.0</td>
</tr>
<tr>
<td>Query 5</td>
<td>3,422,765</td>
<td>508</td>
<td>0:57</td>
<td>4,080</td>
<td>0.0</td>
</tr>
<tr>
<td>Query 6</td>
<td>4,290,648</td>
<td>165</td>
<td>0:53</td>
<td>3,180</td>
<td>0.0</td>
</tr>
<tr>
<td>Query 7</td>
<td>361,521</td>
<td>58,236</td>
<td>0:51</td>
<td>3,120</td>
<td>0.0</td>
</tr>
<tr>
<td>Query 8</td>
<td>3,425,29</td>
<td>724</td>
<td>0:44</td>
<td>2,640</td>
<td>0.0</td>
</tr>
<tr>
<td>Query 9</td>
<td>4,130,107</td>
<td>137</td>
<td>0:42</td>
<td>2,520</td>
<td>0.1</td>
</tr>
</tbody>
</table>

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”
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

### Report for a first assessment:
- Acceleration potential for
  - Queries
  - Estimated time
  - CP cost

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1. **Customer Database**
   - Documentation and REXX procedure

2. **Data package**
   - (mainly unload data sets)
   - Pre-process and load

3. **IBM lab Database**
   - Quick Workload Test Tool
   - Report Assessment

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IBM Smart Analytics Optimizer -- Workload Evaluation & Sizing
Center of Excellence, Datawarehouse on System z, IBM lab Report

### Query Summary

<table>
<thead>
<tr>
<th>Query</th>
<th>Total</th>
<th>With potential</th>
<th>Uncertain</th>
<th>W/o potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blocks</td>
<td>23</td>
<td>11 (47%)</td>
<td>5 (22%)</td>
<td>7 (31%)</td>
</tr>
<tr>
<td>Elapsed Time</td>
<td>144801.47</td>
<td>106216.61 (74%)</td>
<td>1150.21 (6%)</td>
<td>29129.85 (21%)</td>
</tr>
<tr>
<td>CPM Time</td>
<td>21300.26</td>
<td>11620.12 (54%)</td>
<td>1160.12 (7%)</td>
<td>38420.86 (60%)</td>
</tr>
</tbody>
</table>

- **Queries:**
  - no eligible blocks: 0 (0%)
  - not used only: 0 (0%)
  - with very large dims: 1 (4%)
  - with quiet, quiet: 0 (0%)

- **CPU Time:**
  - % of Queries: 23 (100%)
  - with aggregation: 32 (100%)
  - with UDFs: 5 (25%)
  - with unsupported functions: 0 (0%)
  - with unsupported join types: 0 (0%)
  - with very large dimensions: 1 (4%)

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Note: This information is provided in the document for illustration purposes only and does not guarantee characteristics for field supported features of IBM products. IBM 2012.
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