



Business Analytics

IBM
Software
Solutions
Group

Introduction to IBM Cognos Business Intelligence (BI)

New England Users Group (NEDB2UG)

Sturbridge, Massachusetts, USA, <http://www.nedb2ug.org>

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Agenda

- **1: Introduction to COGNOS**
- **2: Instrumentation and Support Tools for Assisting COGNOS Development**
- **3: Cognos for DBA's - 10 things to Know**
- **4: Cognos Solution Example**
- **5: SUMMARY**



Presenting to YOU today:

Milan Babiak

Analytics and System z Evangelist

- Master of Computer Science from Slovak Technical University in Bratislava, Majored in Computer Systems & Architectures in 1991
- *Software Development:* FORTRAN, BASIC, Assembler 8080, 8086, Z80, Pascal, C/C++, Java, XML, SQL, MS-DOS batch scripts, Linux/Unix shell scripts, ... on Linux, Unix/Solaris, Windows, IBM Mainframe – Unix System Services
- *Software Engineering, Consultancy, Architecture, Systems Administration*
- *Industry expertise:* Print & Publishing, Telecommunications, Aviation, Banking
- *Companies worked for:* Jozef Babiak, Klemo, Zick&3cis Slovakia, DITEC Slovakia, ICL Fujitsu, SIEMENS Slovakia, SIEMENS Austria, SIEMENS Canada, AVAYA (1991 – 2008)
- IBM Career: joined in 2008, member of the Team that ported Cognos 8.4.1 on z/OS (2009-2011), Analytics on System z Technical Sales (2011-present)
- *Specialties:* Solutions Architecture, Performance Tuning,
Analytics on System z, Presentations, Motivational Speaking
- *Interests & Passions* 😊 Family. swimming, cycling, hiking, running.
- *Find me on:* LinkedIn: <http://www.linkedin.com/in/milanbabiak>
Twitter: <https://twitter.com/BabiakMilan>



SLOVAKIA



CANADA



Acknowledgements



- To my Mom & Dad in Slovakia:
 - Dad, who taught me to never give up,
 - Mom, who taught me how to put my heart on my sleeve,
- To my wife, who has been always by my side,
- To my children, who make my life worth living,
- To smart folks at Cognos in Ottawa, Canada – Architects, Developers, Testers, Product and Development Managers, Sales, Services & Customer Support Teams ... who brought this amazing Cognos Analytics Engine to the world,
- To Thomas J. Watson, Charles Ranlett Flint:
the Founders of a Great Company – IBM.

1 Introduction to COGNOS

1.1: Introduction to COGNOS

Who is **COGNOS**®?

- Founded in 1969, Ottawa, Ontario - company making Business Intelligence (BI) and Performance Management (PM) software
- Acquired by **IBM** in 2008 -the largest IBM acquisition \$5 billion USD
- The cost of IBM System 360 Project in 1964 was \$5 billion USD, but that money had a way different value then...
- Other IBM acquisitions for illustration - Lotus Development Corporation for \$3.5 B (1995) , Tivoli Systems, Inc. \$743 M, Informix Corporation \$1 B, PWC Consulting from PriceWaterhouseCoopers for \$3.5 B (2002) , Rational for \$2.1 B (2003), **Cognos for \$5 B (2008)**, SPSS for \$1.2 B (2009), Netezza \$1.7 B (2010)



1.2: Introduction to COGNOS

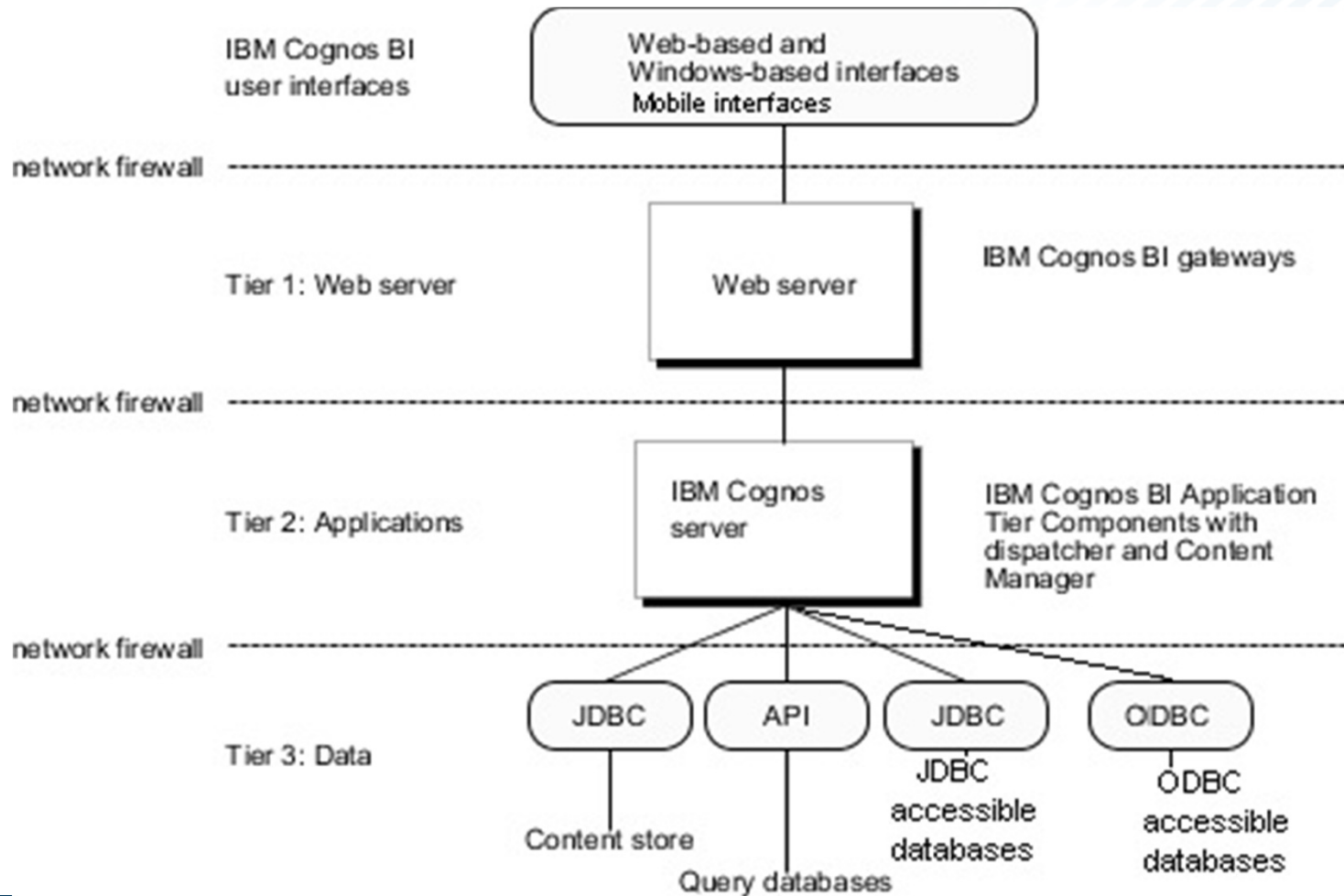
Product History

- Early years 1969-1975: consulting company
- 1980s – shift to Software sales
- Cognos Series 7: Cognos PowerPlay - multidimensional analysis and OLAP reporting software.
- Cognos ReportNet 2003 (CRN) is a web-based software product for creating and managing ad hoc and custom-made reports.
- Cognos 8.1 (2005), 8.2, 8.3, 8.4 (2008)
- Cognos 10 in 2010
- Cognos 10.1 in 2011
- Cognos 10.2 in 2012



1.3: Introduction to COGNOS

Core Architecture



1.4: Introduction to COGNOS

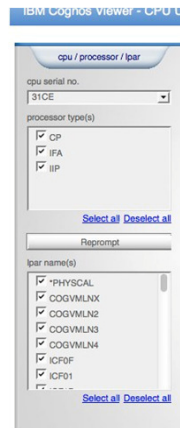
Look & Feel



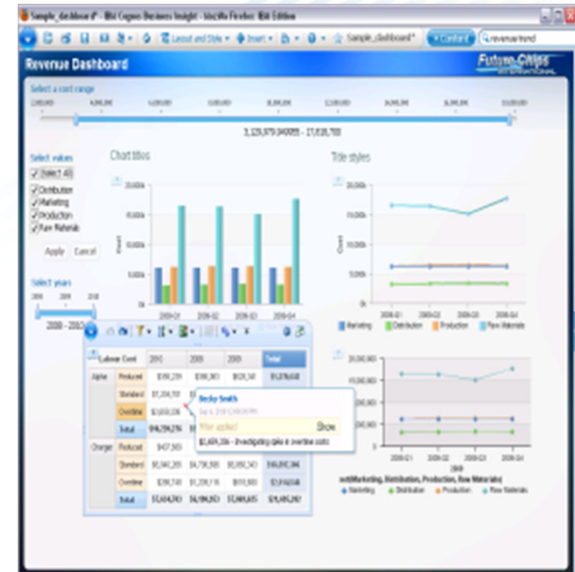
Pixel perfect reporting



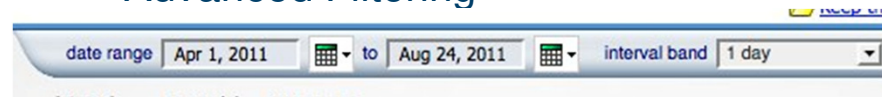
Mobile Analytics online/offline



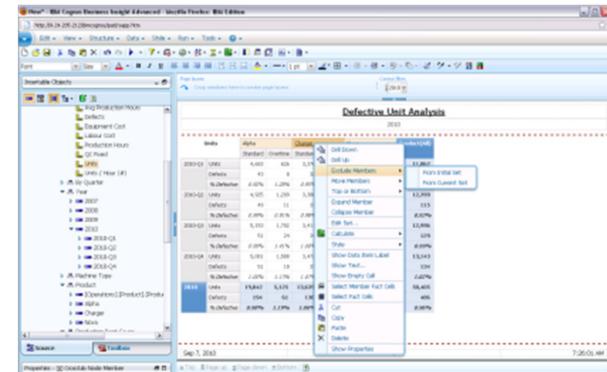
Advanced Filtering



Workspace with intuitive navigation



Easy to use design studios

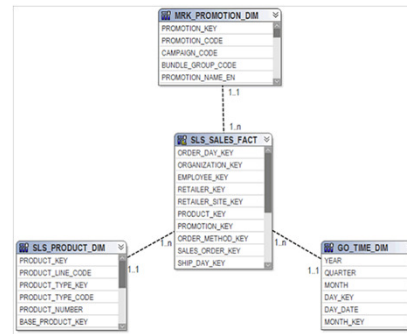


2: Instrumentation and Support Tools for Assisting COGNOS Development

2.1: Cognos Development Workflow

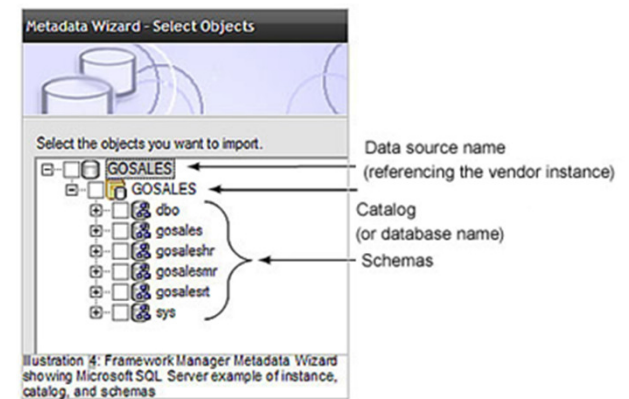
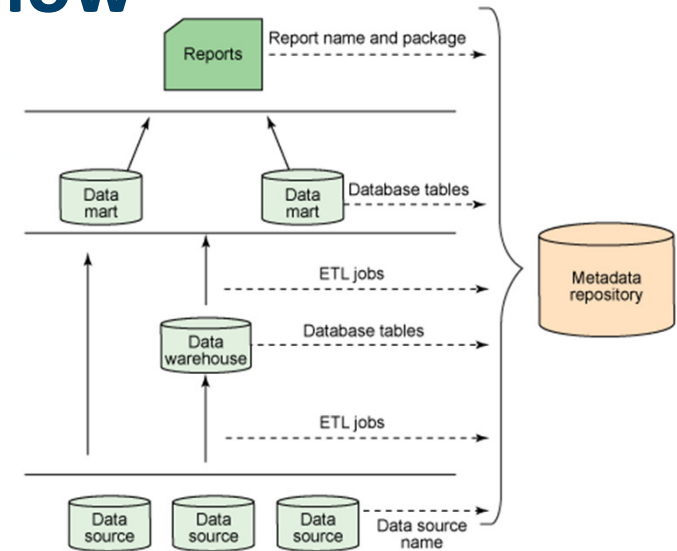
Transactional/Operational data -> ETL

-> Star Schema for reporting data



-> Metadata Modeling

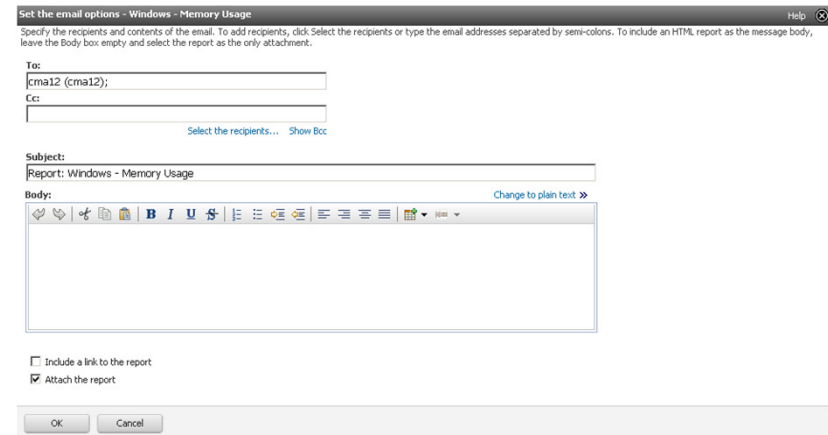
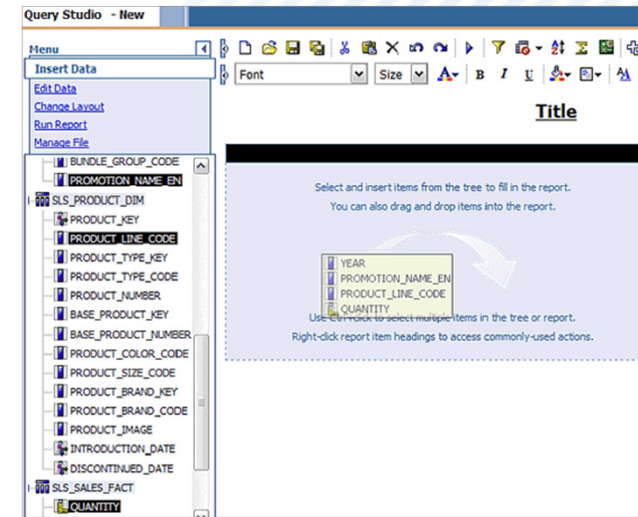
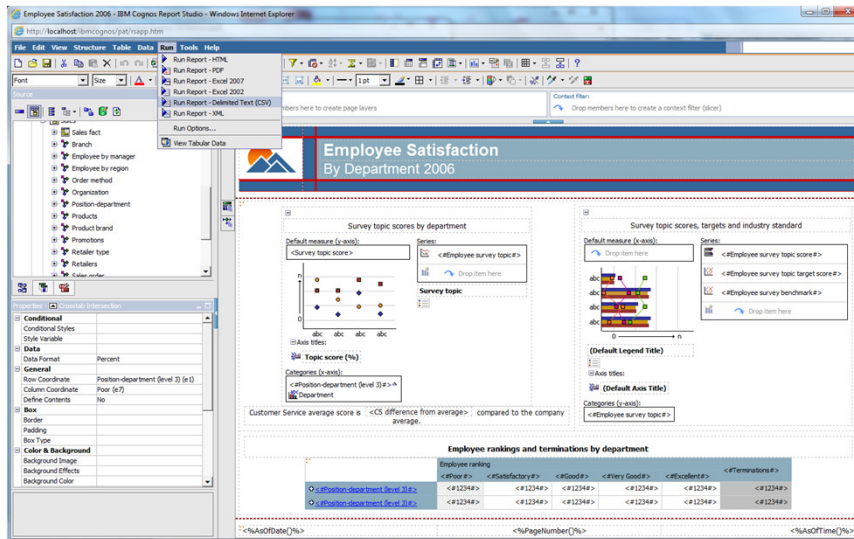
A model in Framework Manager is a business presentation of the structure of the data from one or more data sources (such as IBM Cognos PowerCubes and relational databases). A model describes the metadata objects, structure, and grouping, as well as relationships and security.



2.2: Cognos Development Workflow

-> Ad hoc Analysis

-> Report Authoring

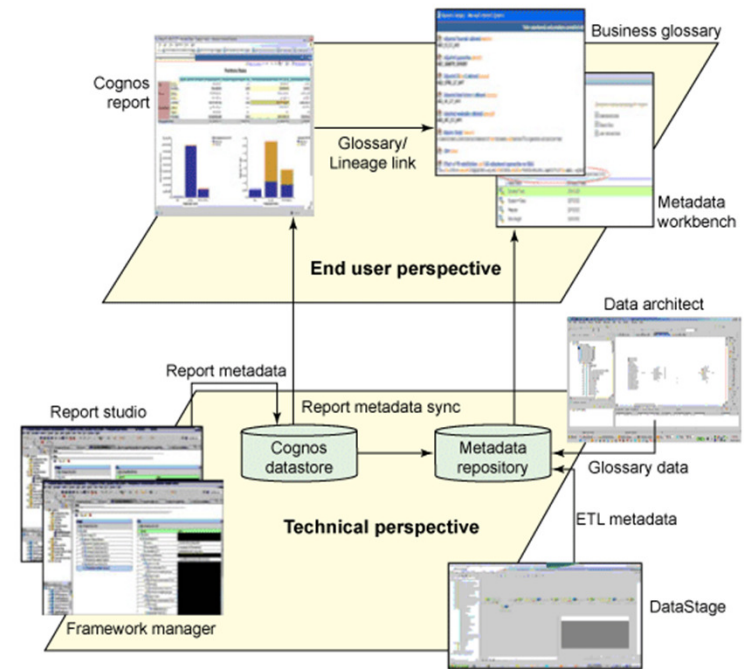
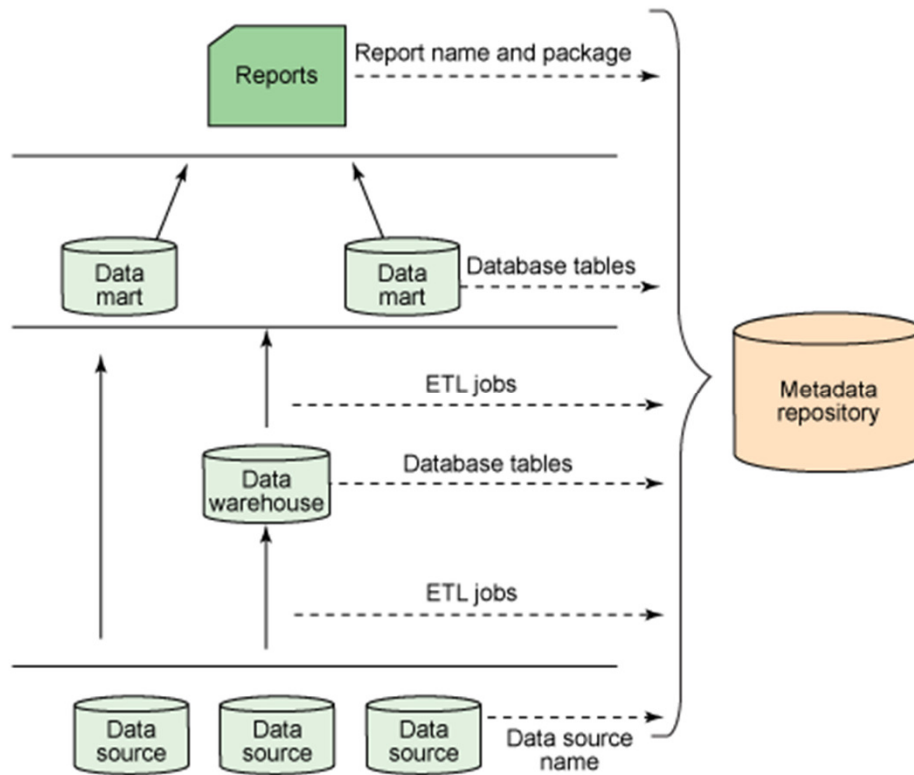


-> Production Reporting and Distribution

2.3: Cognos Development Workflow Extension

Metadata Repository

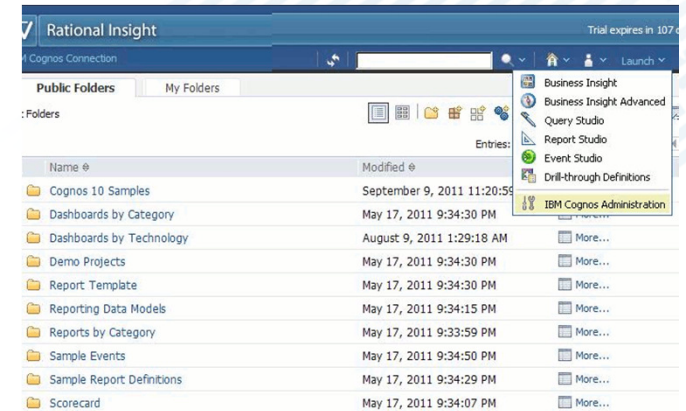
Cognos BI and InfoSphere Integration



2.4: Cognos Development Tools

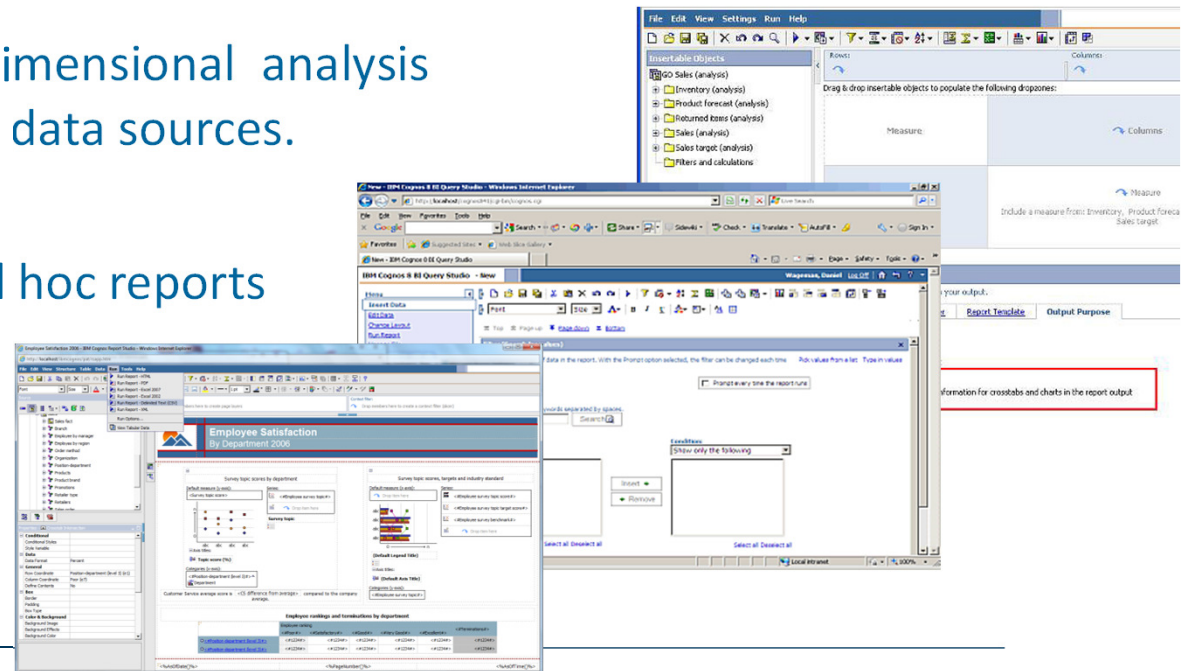
Cognos Connection

Main portal / Management / Administration console used to access reports, schedule reports and perform administrator activities



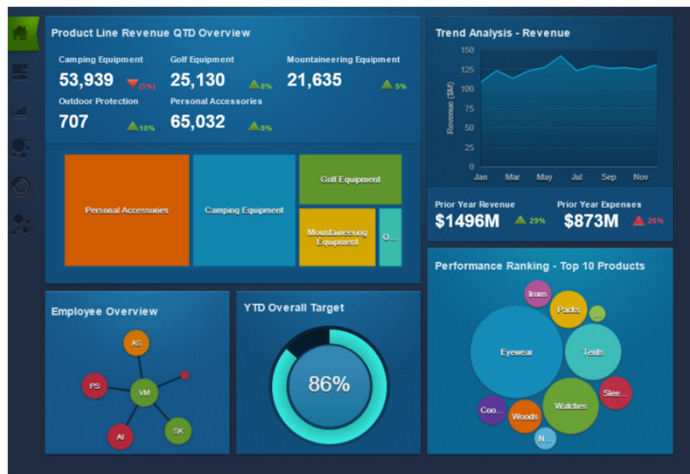
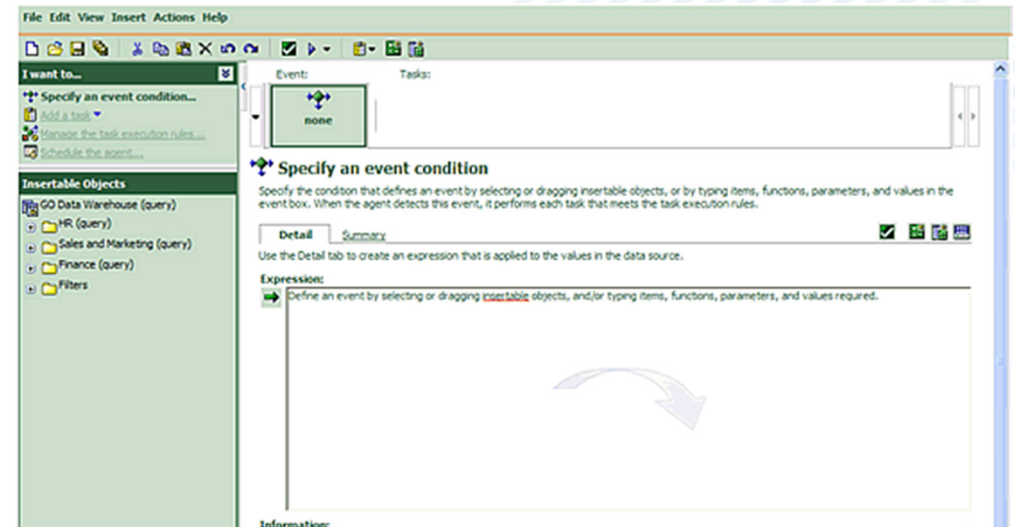
Studios

- **Analysis Studio** - multidimensional analysis and exploration of large data sources.
- **Query Studio** – quick ad hoc reports
- **Report Studio**
- complex pixel-perfect enterprise level reports



2.5: Cognos Development Tools

- **Event Studio** – time or trigger based event scheduling, tasks, jobs, ...
 - **Cognos Workspace - Dashboard**
 - **Active Report**
- Online/Offline mobile analysis

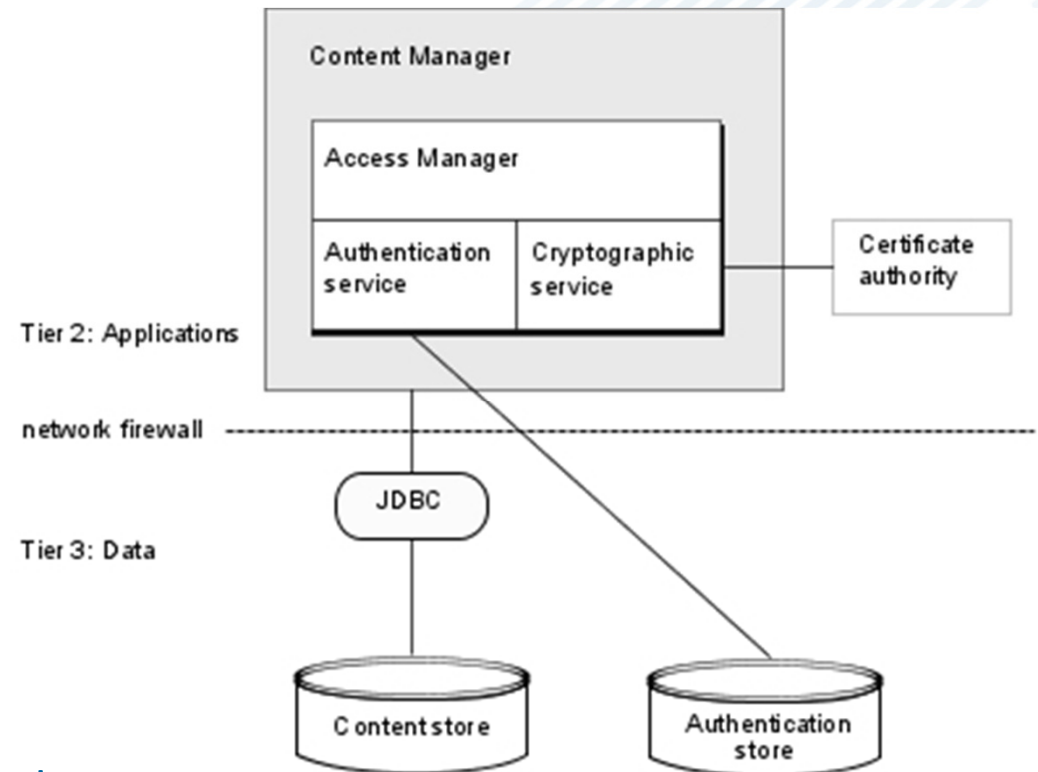


3: Cognos for DBA's - 10 things to Know

3.1: Cognos Operational Database

Called **Content Store**, managed by **Content Manager** module, it stores information about:

- **Cognos BI Server configuration**
 - directory information, Cognos Namespace, contacts, distribution lists, data sources, printers info
- **Reports and Workspaces**
- **Packages**
- **Personal user information**
- **Agents** conditions, schedules, and tasks used to monitor events and deliver notifications
- **Language information** to support multilingual capabilities.



Note to DBA:

This is a Read/Write transactional database, and needs to be maintained in this manner.

3.2: Cognos Data Sources

Relational

- IBM DB2
- IBM Informix
- Microsoft SQL Server
- Oracle
- ODBC Connections
- Sybase Adaptive Server Enterprise

File based

- XML
- CSV or Excel – as ODBC data source

OLAP (Online Analytical Processing) – Dimensional (usually 3+) data sources

- IBM Cognos Cubes
- IBM Cognos TM1®
- IBM Infosphere Warehouse Cubing Services
- Oracle Essbase
- Microsoft Analysis Services
- SAP BW

Note to DBA:

These data sources are mostly in the Read mode, thus need to be maintained / indexed for high performing reads, optimized for reporting - star schema.

3.3: Cognos Data Access

Connection Types

- ODBC (Open Database Connectivity)
- JDBC (Java Database Connectivity)
- File based – CSV, XML

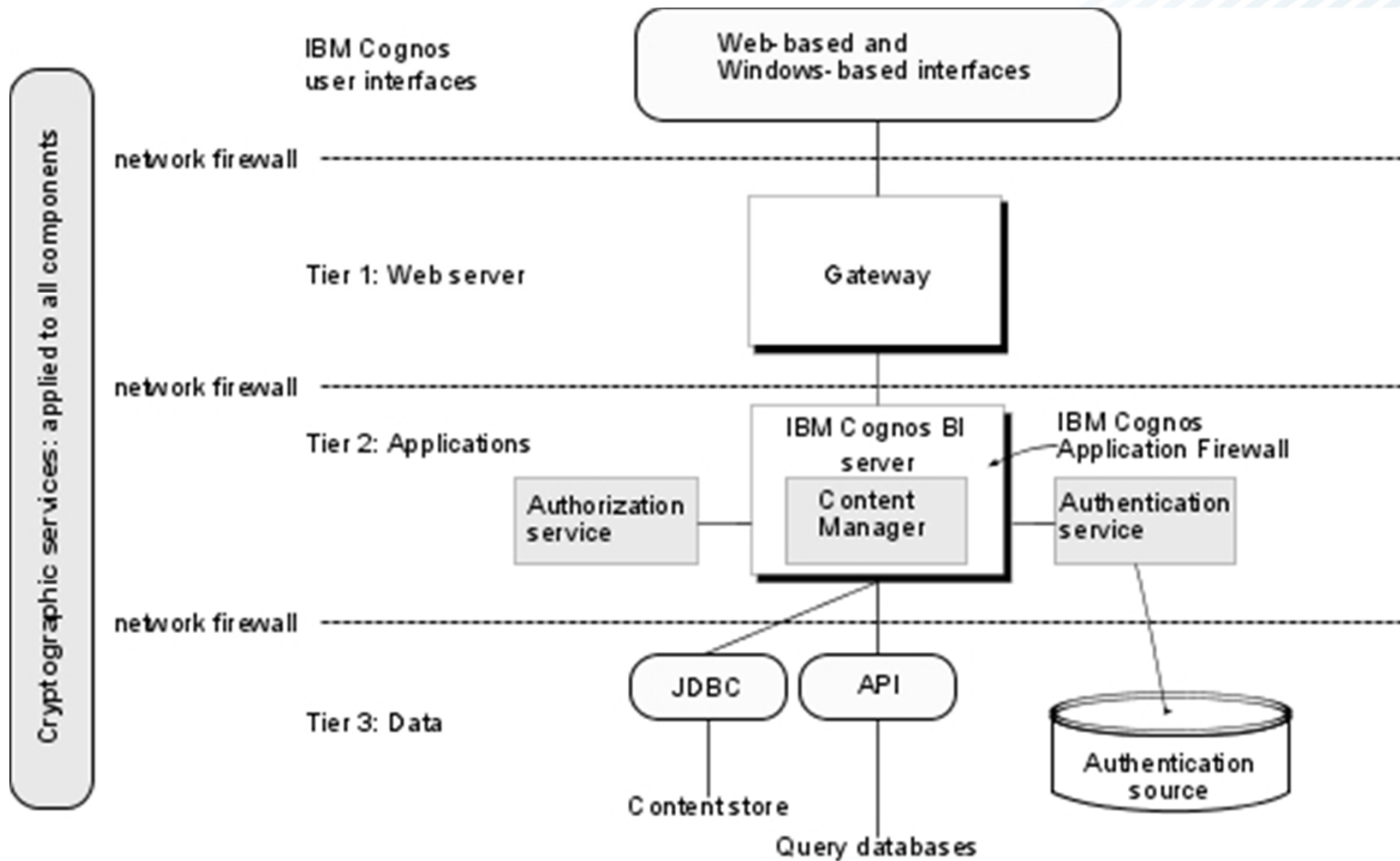
How does the data show up in the report?

- Metadata mapping in Cognos Framework Manager: Database column name -> Query Subject
- Query Subject Drag & Drop onto report layout in Report Studio
- Data retrieval for a field in a report from database row/column happens in multiple translations:
- Report specification (XML) -> Query Subject Metadata mapping -> Cognos Universal Data Access (UDA) -> SQL query -> JDBC/ODBC driver

Note to DBA:

Cognos generates the SQL queries for you – this is the magic 😊 happening behind the scenes of your GUI based report!

3.4: Cognos Security at a glance



3.4: Security – Authentication, Firewall, Encryption

- **Authentication providers:**

- Resource Access Control Facility (RACF)
- Lightweight Directory Access Protocol (LDAP)
- Microsoft Active Directory
- IBM Cognos 7 namespaces
- eTrust SiteMinder
- Custom Java Authentication provider

- **IBM Cognos Application Firewall**

Validates and filters incoming and outgoing traffic at the dispatcher layer.

- **Encrypted Cognos assets**

Cognos Configuration file, temporary files, passwords, report data transmitted over the network

3.5: Security - Authorization

Authorization services are provided in Content Manager

- **Distributed Administration**

The IBM Cognos BI security model supports the distribution of security administration.

- **Permissions**

Permissions define access rights to objects, such as directories, folders, and other content, for each user, group, or role. Permissions also define the activities that can be performed with these objects.

- **Multi-tenancy**

Introduced in Cognos 10, Multi-tenancy provides the capability to support multiple customers or organizations (tenants) by using a single deployment of an application, while ensuring that each tenant can access only the data that they are authorized to use.

3.6: Automated Report Processing

Cognos Reports can be run:

- Interactive/manual mode - on demand
- Trigger based – database value change, external event (web service, batch job, ...)
- Schedule based – regular intervals – hourly, daily, weekly, monthly, quarterly, annually, ...

3.7: Production Reporting - Performance

Cognos Reports can be run in high volumes - Examples:

- Bank monthly account statements in PDF with charts
- Quarterly investment portfolio reports
- Database value threshold notifications

3.8: Programmatic User Interface - SDK

- The **IBM® Cognos® Software Development Kit (SDK)** provides a platform-independent automation interface for working with IBM Cognos BI services and components. APIs: Java, .NET Framework languages
- SDK enables **Integration of Cognos User Interface** into other applications - user interface customization

Examples: IBM Open Pages – Governance, Risk and Compliance, IBM Tivoli Common Reporting

- SDK enables developers in your organization to create custom reports, manage deployment, and integrate security and portal functionality
- SDK uses a collection of cross-platform Web services, libraries, and programming interfaces.

3.9: Globalization and Multi language Support

Changing the Language of the User Interface

Product locale controls the language of the user interface and all messages, including error messages.

Name	Modified	Actions
Actual Sales against Target Sales	July 19, 2005 9:43:13 AM	[Run] [Options] [Edit] [Schedule] [More...]
Actual Sales against Target Sales-burst	July 19, 2005 9:45:54 AM	[Run] [Options] [Edit] [Schedule] [More...]
Banded Report	July 19, 2005 9:48:39 AM	[Run] [Options] [Edit] [Schedule] [More...]
Basket Analysis with Total Contribution (Top 10 Rank)	August 15, 2005 2:21:41 PM	[Run] [Options] [Edit] [Schedule] [More...]
Business Details Drill Through	August 15, 2005 12:56:30 PM	[Run] [Options] [Edit] [Schedule] [More...]



Changing the Language of Reports, Data, or Metadata for Users

Users see reports, data, or metadata in their preferred language, or in a language specific to their region, add and remove partial locales (language) or complete locales (language-region) in the Content Locales table.

Customizing Currency, Numbers, Dates, and Times

- IBM Cognos BI provides a complete set of default locale formats for number, dates (short, long, complete, and abbreviated), times, intervals, and currencies across almost 200 locales.

3.10: Cognos Mobile - Demo

Offline Content Analysis - Cognos Active Report on the iPad

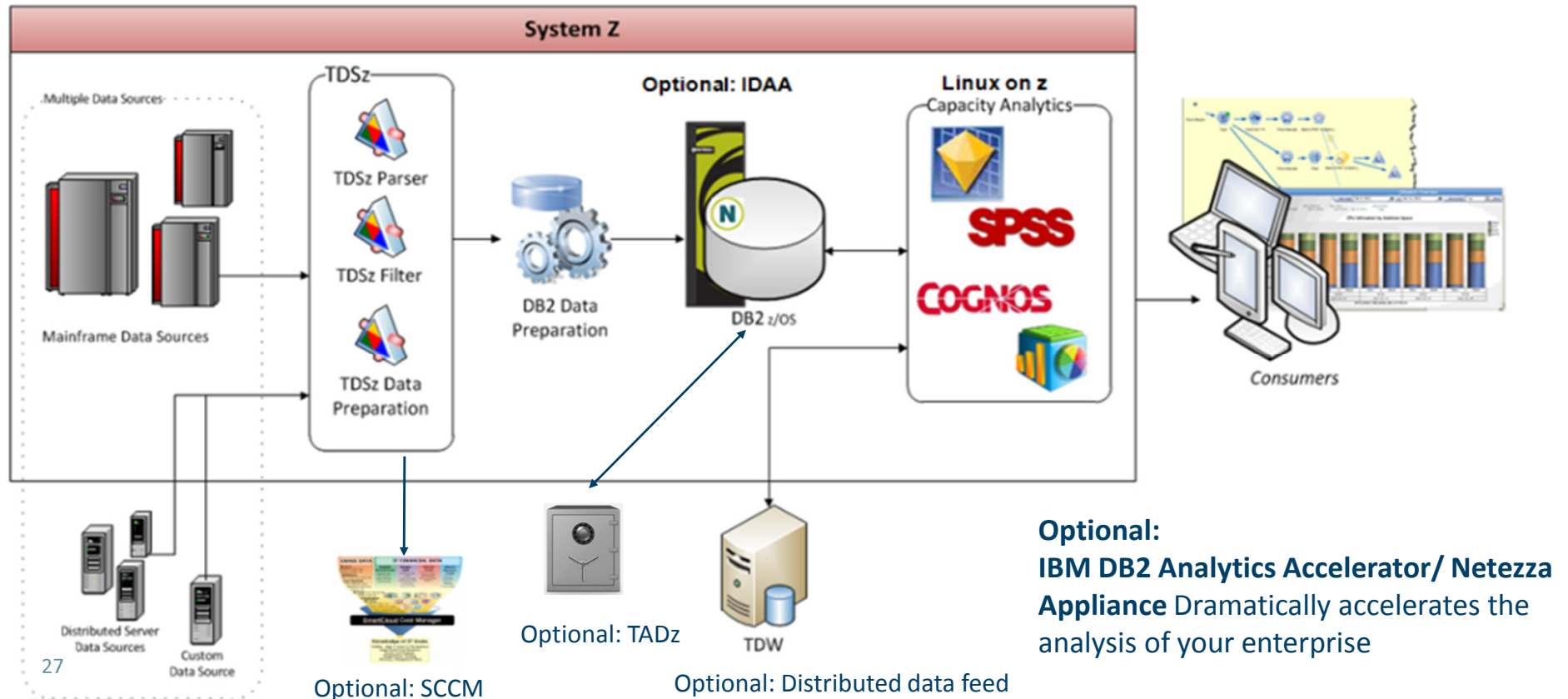


4.1: Cognos Solution Example: IBM Capacity Management Analytics

Tivoli Decision Support for z/OS Data collection for the solution, builds the data warehouse in DB2 for z/OS

Cognos Business Intelligence Analytics capabilities for optimizing your enterprise

SPSS Modeler with Scoring Adapter Predictive analytics to forecast future requirements
SPSS Scoring Adapter for DB2 for z/OS provides real-time anomaly detection



Optional: IBM DB2 Analytics Accelerator/ Netezza Appliance Dramatically accelerates the analysis of your enterprise

4.2: Cognos Solution Example: IBM Capacity Management Analytics



- 1 - "Drill to" menu
- 2 - Standard Prompts (date & time ranges)
- 3 - Report Specific Prompts (CPU, processor type)

- 4 - "Refresh view " buttons
- 5 - Report Body with charts or table

Cognos Business Intelligence - Resources

- [Cognos Business Intelligence Welcome Page](#)

Online Documentation

- [IBM Cognos Business Intelligence, Version 10.2.1 Information Roadmap](#)

Overview, new features in 10.2.1, Redbooks

- [Capacity Management Analytics - Intro](#)

Solution Introduction



5: SUMMARY

- **1: Introduction to COGNOS**
- **2: Instrumentation and Support Tools for Assisting COGNOS Development**
- **3: Cognos for DBA's - 10 things to Know**
- **4: Cognos Solution Example:
IBM Capacity Management Analytics**



Q&A

