A Next-Generation Oracle BI Architecture

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Who Am I?

- Oracle BI&W Architecture and Development Specialist
- Co-Founder of Rittman Mead Consulting
  - Oracle BI&W Project Delivery Specialists
- 10+ years with Discoverer, OWB etc
- Oracle ACE Director, ACE of the Year 2005
- Writer for OTN and Oracle Magazine
- Longest-running Oracle blog
  - [http://www.rittmanmead.com/blog](http://www.rittmanmead.com/blog)
- Chair of UKOUG BIRT SIG
- Co-Chair of ODTUG BI&DW SIG
- Second year of OU BI Masterclasses
  - 18 countries visited in 2006-7
Rittman Mead Consulting

- Oracle BI&DW Project Specialists
- Consulting, Training, Support
- Works with you to ensure OBIEE project success
- Small, focused team
- OWB, Oracle BI, DW technical specialists
- Clients in the UK, Europe, USA
Why a Next-Generation Oracle BI Architecture?

- Business intelligence has evolved
- Organizations now wish to deliver pervasive Enterprise Performance Management across all of their data and processes
- Oracle has evolved to meet that challenge
  ‣ Acquisition of Siebel (Siebel Analytics)
  ‣ Acquisition of Hyperion (Hyperion Financial Management, Essbase)
  ‣ Continual development of Oracle Database, OWB
  ‣ Incorporation into Fusion Middleware
- Lots of new products, lots of opportunities

But ... **what do you do with it all?**
Oracle Business Intelligence Enterprise Edition Plus

- Dashboards, Answers, Delivers, Oracle BI Server
- Complete set of web-based query, reporting and analysis tools
- Now comes with Hyperion front-end tools (OBIEE+)
- Based on Siebel Analytics
- Heterogeneous database access
- Logical Business Model
- Data integration capabilities
Oracle Database 11g

- The latest release of the Oracle database
- Enterprise Edition contains a large number of data warehousing features
  - Partitioning
  - Bitmap indexes
  - Star transformations
  - Compression
- Options for in-database OLAP and Data Mining
- Core technology for data warehousing and analytics
ETL Tools

- **Oracle Warehouse Builder** is now part of Oracle Database 11g
  - Data modeling, Data mapping, workflow, data profiling
  - Installed along with the database
  - Core functionality is free, options available for data profiling and large-scale ETL
- **ODI** (previously Sunopsis) is part of Oracle Fusion Middleware
  - Similar capabilities to OWB but across heterogeneous platforms
Oracle Fusion Middleware

- Middleware architecture for Oracle products
- SOA-enabled J2EE environment
- Security, BI, user interaction, systems management, tools, BPM
Proposed Architecture

- Three-layer architecture, based around OBIEE framework, Hyperion and Oracle Database
- Presentation Layer contains query tools
  ‣ Dashboard, Answers, Hyperion, SOA
- Business Logic Layer contains Metadata
  ‣ Oracle BI Server
- Data Services layer contains data and supporting processes
  ‣ Connections to Application Data Sources
  ‣ ODI, OWB, Web Services
  ‣ Data Warehouse
  ‣ OLAP Server
The Presentation Layer

- Data access layer, query tools, interfaces, MS Office integration
- Oracle BI Answers, Dashboard, BI Publisher
- BI Office integration
- SOAP (SOA) interface
- ODBC interface (BO, Cognos etc)
- Hyperion tools
  - May access Essbase directly, by-passing Business Logic Layer
Oracle Dashboards, Answers, Delivers

- Interactive environment for running reports, graphs, alerts
- Online or Disconnected
- DHTML, zero-footprint
Hyperion Web Analysis, Essbase and Workspace

- For OLAP analysis, works against Essbase OLAP server
- Can take data sourced from OBIEE repository
- Adds high-end analysis capabilities to OBIEE stack
The Business Logic Layer

- Contains an integrated, logical model of the business
- Provides an abstraction layer for the business
- Can be auto-generated by the ETL tool
  - OWB 11gR2
- Maintained by the business
- Can connect to multiple sources in the data services layer
  - The Oracle data warehouse
  - Direct application access
  - OLAP cubes
  - Relational databases
The OBIEE Repository ("Common Enterprise Information Model"

- Maintained using Oracle BI Administrator
- Common metadata
- Dimensions, calculations
- Administration of Oracle BI Server
The Data Services Layer

- Provides data to the BI applications
- Data can come from a variety of source
  - Applications
  - External data
  - Files, XML, documents
  - Databases and repositories
  - Data warehouses and data marts
- OBIEE provides a “federated query” feature that permits queries against all data sources
But How Do We Deliver It?

• This isn't too far away from how we do things now
  ‣ A data warehouse, some metadata and a query tool

• Traditionally, organizations have built BI systems in one of two ways
  ‣ User-driven - gets reports fast, at the cost of long-term manageability
  ‣ IT-driven - solid foundation, at the cost of immediate results and user involvement

• Oracle’s next-generation BI tools allow us to combine the two approaches
Next-Generation BI Project Stages

• Stage 1 - Initial quick wins and development of a pilot system
  ‣ Data accessed direct from source applications
  ‣ Initial implementation of OBIEE Enterprise Semantic Model
  ‣ Used to provide reports quickly, and to gather detailed requirements

• Stage 2 - Gradually consolidate data into a data warehouse
  ‣ Use ETL tool such as ODI, OWB to map data from sources
  ‣ Consolidate data over time into scalable, secure data warehouse
  ‣ Re-wire Enterprise Semantic Model to use data warehouse
  ‣ Gradually provide “one version of the truth”

• Stage 3 - In the future - take advantage OBIEE11g+ features
  ‣ Data Mart Automation
  ‣ Integration of Hyperion tools
Stage 1 - Initial Quick Wins

- Install and configure OBIEE
- Initial definition of business logic layer
  - First-cut Enterprise Semantic Model
  - Dimensional view of the data you wish to report against
  - Single integrated model
- Oracle BI Server initially gets data directly from the source applications
- Data Services layer will initially contain source applications, simple temporary and staging tables
- Delivers initial reports, quick-wins
- Sound basis for rest of project
Stage 1: OBIEE RPD Build Using Source Apps Tables

Single Logical Model → Application Data Sources
Demonstration

Oracle BI Dashboards working against application source data
Stage 2 - Consolidation of Data into the DW

- Over time, data from source applications will be combined into a data warehouse
  - Use OWB if largely Oracle-based
  - Use ODI if heterogenous data
- Incorporate data from Web Services, events, MDM, ECM
- Make use of Oracle RDBMS scalability, performance, in-database OLAP and DM
- Reports and Semantic Model stay the same
- Direct access to data still supported
  - Applications not yet in DW
  - New requirements
Stage 2: OWB used to Migrate Source Data to Data Warehouse
Stage 2: OBIEE Repository Reconfigured To Use DW Tables

The Same Logical Model

Data Warehouse Data Source
Demonstration

Migrating OBIEE data into a Data Warehouse using OWB Dashboard Reports and OBIEE Metadata preserved
Stage 3 - Incorporate OBIEE11g+ Functionality

- Potential futures
- Data Mart Automation
  - Automatic creation of relational data mart / data warehouse
  - Automatic creation of OLAP cubes
- ETL Automation
  - “Function-shipping” data movement
  - Automate the re-wiring of Logical Business Model to the DW
- Action Framework
- Hyperion / Essbase Integration
- New database capabilities
Enterprise Content Management

- Repository of unstructured data
- Data should ideally be stored in a database structure so it can be referenced directly
- If the data is held in a database, it can be text-mined in place, results (and pointers back to original documents) can be posted to the DW through the staging layer and held in the FDL
- ECM can also be used as a repository for reports and analyses exported from reporting tools.
  - “Sealed Media” (Information Rights Management - IRM) approach can be used to enable security policy beyond the realm of DW and reporting tools.
Security and Information Lifecycle Management

- Security layer extends throughout entire solution
- Corporate wide security policy (e.g. LDAP, Active Directory) should be extended to DW / Reporting solution
  - Implement through OBIEE for heterogeneous data services
  - Implement through VPD for Oracle DW-centric solutions
- Record level / role based / segregation of duty security should be deployed as good practice and for compliance reasons.
Summary

• BI presents a lot of new opportunities and possibilities
• Lots of new tools that make lots of new things possible
• Adopt SOA idea of presentation, business logic and data services layers
• It is now possible to resolve the user-driven vs. IT-driven dilemma
• Start with the Enterprise Semantic Layer, point to application sources to provide quick-win reports against a consistent data model
• Over time, consolidate into a data warehouse
• Introduce Hyperion functionality at presentation and data services layer
  ‣ In time, introduce Hyperion metrics and logic into business logic layer
• Faster time to delivery with a scalable, maintainable infrastructure
For More Information

• The Rittman Mead Blog

• Read our Oracle Technology Network and Oracle Magazine articles
  ‣ [http://otn.oracle.com](http://otn.oracle.com)
  ‣ [http://www.oracle.com/oramag](http://www.oracle.com/oramag)

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