Using Oracle9i Warehouse Builder
to create OLAP Warehouses

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Chris Claterbos
claterbos@vlamis.com

Dan Vlamis
dvlamis@vlamis.com

Vlamis Software Solutions, Inc.
http://www.vlamis.com

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Vlamis Software Solutions, Inc.

- Founded in 1992 in Kansas City, Missouri
- A Member of Oracle Partner Program since 1995 along with various Oracle Beta Programs
- Designs and implements databases/data marts/data warehouses using RDBMS and Multidimensional tools
- Specializes in Data Transformation, Data Warehousing, Business Intelligence, Oracle Financials and Applications Development
- Founder Dan Vlamis is former developer at Oracle-Waltham office for Sales Analyzer Application
- Oracle Solutions Provider
Using OWB to 9i OLAP Databases

- Oracle 9i and OLAP
- What is Oracle Warehouse Builder?
- Oracle 9i Integration
- The Process
- OWB Transfer Wizard
- Demonstration
- Managing an OLAP project
- Getting Started
- Questions
Why a Separate OLAP Tool?

- Empowers end-users to do own analysis
- Frees up IS backlog of report requests
- Ease of use
- Drill-down
- No knowledge of SQL or tables required
- Exception Analysis
- Variance Analysis
- Complex Data Calculations and Projections
Oracle 9i RDBMS - MDDS

Oracle 9i Database

Oracle Call Interface  JDBC

Relational Technology  Object Technology  OLAP Technology

SQL Engine  OLAP_TABLE  Multidimensional Engine

Storage

Relational Cubes  Multidimensional Cubes
What Does 9i OLAP Add?

- Multidimensional user view of data
- Users create own reports
- Users create own measures
- Easy drill-down, rotate
- Iterative discovery process (not just reports)
- Ad-hoc analysis
- Easy selection of data with business terms
- OLAP DML with what-if, forecasting
What Makes a DW OLAP-Ready?

- Star schema design
- Simple dimension tables (level-based)
- All tables dimension or fact (no “auxiliary tables” for dimension tables)
- Each child has single parent in a hierarchy (no many-to-many)
- Total level at top of each dimension
- End_date and Time_span attributes for TIME
- Unique descriptions across all levels
- Fact tables with additive measures
Why OWB to build 9iOLAP?

- Integrated with entire Oracle stack
- Graphically designs, generates, and deploys
- Only ETL tool that understands 9iOLAP
- Uses 9i PL/SQL for transformations
- One-click deployment of 9iOLAP AW
What is Oracle Warehouse Builder?

- Integrated Tool for Data Warehousing
- Based on Common Warehouse Metadata Standard (OMG)
- Supports Design and ETL Functions
- Enterprise Framework for Designing and Deploying Datawarehouses and Datamarts
- Integration platform for 9i OLAP
What is OWB?
Components: Overview

Components of Oracle Warehouse Builder
- Repository (CWM)
- Graphical User Interface
- Code Generator
- Integrators
- OWB Bridge
Components: OWB Repository

- Based upon Common Warehouse Metadata Standard (CWM)
- Supports Industry Standards
- Oracle 9i based
- Integration point for future products (Designer, Developer, BI Beans …)
Components: OWB User Interface

Java Based
Same look and feel as Designer
Can run as Thick or Thin Client
Components: Code Generators

Code Generators are provided for:

- Transformations
- DDL
- SQL Loader scripts
- User Defined transformations
Components: Integrators

• Several Integrators provided
• Relational and non-relational support
• Oracle Applications Data Source
• SAP R/3 Data Source
• Discoverer
• Express
• CWM
• Oracle 9i OLAP
• OWB 9.2.0.2 Introduces new Java API for OWB
• Basic Functionality Supported:
  □ Access to Metadata
  □ View definitions of objects in metadata
  □ Manage Deployment
  □ Import and Export Metadata
  □ Manage Project objects
• Documentation is JavaDoc
• No samples YET!
Components: OWB Transfer Wizard

- Bridging Technology to 9i OLAP, Express, CWM and Discoverer
- Supports 9i OLAP as a Source and a Target
- No support for Express MOLAP
- Only supports Express RAM as a Target
9i OLAP Integration

- OWB Bridge transports OWB metadata to Oracle 9i OLAP Metadata
- Creates links to Relational Data for Facts and Dimensions
- Creates Scripts for building Materialized Views that are BI Beans OLAP friendly
- Creates Scripts to build and populate Analytic Workspaces
- User can use OEM Cube Builder to make changes (not recognized in OWB repository)
The Process – Building OLAP Cubes

- Design or Import Relational Schema
  - Define Fact Table(s)
  - Define Dimensions
  - Define Cubes (collection of like measures)
- Create Physical Schema
- Create Script for 9i OLAP
- Run Script
- View/Modify in OEM/Cube Builder
- Run Application
- Gather Statistics / Tune
Design and Generate Schema
Creating Dimensions

- Use OWB to Create Dimensions
- Use the following “Special” Attributes when building OLAP Dimensions

<table>
<thead>
<tr>
<th>Physical Level Attribute Name Suffixes in Warehouse Builder</th>
<th>Dimension Attribute Created</th>
</tr>
</thead>
<tbody>
<tr>
<td>_NAME or NAME</td>
<td>Short_Description or Long_Description</td>
</tr>
<tr>
<td>_END_DATE or END_DATE</td>
<td>End_Date</td>
</tr>
<tr>
<td>_TIME_SPAN or TIME_SPAN</td>
<td>Time_Span</td>
</tr>
<tr>
<td>_PRIOR_PERIOD or PRIOR_PERIOD</td>
<td>Prior_Period</td>
</tr>
<tr>
<td>_YEAR_AGO_PERIOD or YEAR_AGO_PERIOD</td>
<td>Year_Ago_Period</td>
</tr>
</tbody>
</table>
Creating Dimensions

### Table Properties: OWB_TIMEDIM_DATA_TABLE [Read/Write]

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Data Type</th>
<th>Length</th>
<th>Precision</th>
<th>Scale</th>
<th>Not Null</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEEK_OF_YEAR</td>
<td>15</td>
<td>NUMBER</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>True</td>
<td></td>
</tr>
<tr>
<td>WEEK_START_DATE</td>
<td>16</td>
<td>DATE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>True</td>
<td></td>
</tr>
<tr>
<td>WEEK_END_DATE</td>
<td>17</td>
<td>DATE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>True</td>
<td></td>
</tr>
<tr>
<td>WEEK_TIME_SPAN</td>
<td>18</td>
<td>NUMBER</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>True</td>
<td></td>
</tr>
<tr>
<td>MONTH_ID</td>
<td>19</td>
<td>NUMBER</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>True</td>
<td></td>
</tr>
<tr>
<td>MONTH_OF_QUARTER</td>
<td>20</td>
<td>NUMBER</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>True</td>
<td></td>
</tr>
<tr>
<td>MONTH_OF_YEAR</td>
<td>21</td>
<td>NUMBER</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>True</td>
<td></td>
</tr>
<tr>
<td>MONTH_START_DATE</td>
<td>22</td>
<td>DATE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>True</td>
<td></td>
</tr>
<tr>
<td>MONTH_END_DATE</td>
<td>23</td>
<td>DATE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>True</td>
<td></td>
</tr>
<tr>
<td>MONTH_TIME_SPAN</td>
<td>24</td>
<td>NUMBER</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>True</td>
<td></td>
</tr>
<tr>
<td>QUARTER_ID</td>
<td>25</td>
<td>NUMBER</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>True</td>
<td></td>
</tr>
<tr>
<td>QUARTER_OF_YEAR</td>
<td>26</td>
<td>NUMBER</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>True</td>
<td></td>
</tr>
</tbody>
</table>
Creating Time Dimensions

- Time Dimensions are “Special” Dimensions that allow for several analytic analyses such as “Sales last month compared with same month last year”
- Requires special attributes
- OWB has sample definition and SQL scripts for “Best Practice”
- Always use “Time” or “_Time” in Dimension Name – Like “T_TIME”
Creating Time Dimension

Time Dimension Attributes:

<table>
<thead>
<tr>
<th>Physical Level Attribute Name Suffixes in Warehouse Builder</th>
<th>Dimension Attribute Created</th>
</tr>
</thead>
<tbody>
<tr>
<td>_YEAR</td>
<td>Year Level</td>
</tr>
<tr>
<td>_QUARTER</td>
<td>Quarter Level</td>
</tr>
<tr>
<td>_MONTH</td>
<td>Month Level</td>
</tr>
<tr>
<td>_DAY</td>
<td>Day Level</td>
</tr>
</tbody>
</table>

Note: Week is not included because week cannot neatly rollup into calendar year.
Time Dimension

Fill in the fields and click Add to create a new level.

Define Level

Name:
L_DAY

Prefix:
L_DAY

Description:
Day level ...

Levels:
L_DAY
L_MONTH
L_QUARTER
L_YEAR
Defining Cubes

• Cube is a collection of Measures (Data)
• All measures in a cube have the same dimensionality
• Use OWB Cube Wizard to build Cubes
Finished Cube
Metadata Export - Bridge

Welcome to the OWB Transfer Wizard

This wizard helps you export metadata from Warehouse Builder to other tools, such as Oracle Discoverer and Oracle Express.

The steps to transfer metadata are:

1. Identify your metadata target.
2. Enter or change the object or filename parameters for the transfer source and target.
3. Run the transfer process.
OWB Transfer Wizard

- What does the OWB to 9i OLAP Transfer do?
  - Converts Metadata to CWM Format
  - Create SQL Script to update 9i OLAP Metadata
  - Executes Script
  - Allows for Building AW Cubes
  - Moves Data from relational to AW
OWB Transfer – Choose Destination

Source and Target Metadata Locations

The product that contains the metadata

From: OWB Export

Select the product where you want to transfer the metadata

To: OWB Export

Enter a description (optional)

Oracle OLAP Server Import
Oracle Discoverer
Oracle Express
Oracle Discoverer 4

Next > Finish
## OLAP Bridge – Transfer Parameters

### Metadata Object/Filenames and Detailed Transfer Parameters

Enter or change the transfer parameter values.

<table>
<thead>
<tr>
<th>Transfer Parameter Name</th>
<th>Transfer Parameter Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OWE Exported Business Areas</td>
<td>All Business Areas</td>
</tr>
<tr>
<td>Username</td>
<td>BIBDEM</td>
</tr>
<tr>
<td>Password</td>
<td>********</td>
</tr>
<tr>
<td>Hostname</td>
<td>chris-insp4000</td>
</tr>
<tr>
<td>Port</td>
<td>1521</td>
</tr>
<tr>
<td>SID</td>
<td>orcl</td>
</tr>
<tr>
<td>PL/SQL Output File</td>
<td>D:\Projects\OUGA-2002\OUGA-2002.sql</td>
</tr>
<tr>
<td>Deploy PL/SQL in database</td>
<td>No</td>
</tr>
<tr>
<td>Log Level</td>
<td>Information</td>
</tr>
</tbody>
</table>

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OLAP Bridge – Transfer Parameters

Confirmation of Oracle WB Transfer

<table>
<thead>
<tr>
<th>Transfer Parameter Name</th>
<th>Transfer Parameter Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OWB Exported Business Areas</td>
<td>All Business Areas</td>
</tr>
<tr>
<td>Username</td>
<td>EIBDEMO</td>
</tr>
<tr>
<td>Password</td>
<td>********</td>
</tr>
<tr>
<td>Hostname</td>
<td>chris-insp4000</td>
</tr>
<tr>
<td>Port</td>
<td>1521</td>
</tr>
<tr>
<td>SID</td>
<td>orcl</td>
</tr>
<tr>
<td>PL/SQL Output File</td>
<td>D:\Projects\IOUGA-2002\IOUGA-2002.sql</td>
</tr>
</tbody>
</table>

Click Finish to begin the transfer process.
OEM Cube Builder – The Results
Loading AW Data

- OWB provides Transformations to Load Data into AWs
- Default behavior is to load the entire set of data
- Supports Sub-Setting with customize SQL i.e.

```sql
procedure ORDERS_LOAD_FILTER
BEGIN
    dbms_awm.create_awcubeload_spec ('ORDERS_FIL', USER, 'ORDERS', 'LOAD_DATA');
    --- Define the Limiting Where Clause Here
    dbms_awm.Add_AWCubeLoad_Spec_Filter('ORDERS_FIL', USER, 'ORDERS', 'month_id>33');
    dbms_awm.refresh_awcube (USER, 'AWS', 'AWORDERS', 'ORDERS_FIL');
EXCEPTION
    WHEN OTHERS THEN
        NULL;
```
Demonstration
Managing an OLAP Project

- Involve end-users early on
- Prototype, pilot, then phase 1
- Recruit "champion" users
- Lead from user community, not IT
- Develop in phases
- Provide value early on
- Keep it simple (at first)
- Need forum for users to share ideas
- Provide user guide with user's data
OLAP Implementation Suggestions

- Pick single first department
- Decide on set of terminology at beginning
- Use embedded-total objects
- Show instances in addition to "levels" in diagrams
- Prototype and design iteratively
- Pick small initial project. Deliver value quickly
- Involve users early on. Listen to feedback
Conclusions

- We can finally design OLAP Solutions
- Support for both ROLAP and MOLAP (AW)
- Strong Foundation for the Future
- Still Lacking all the Pieces
  - No Bi-Directional Bridge using OEM
  - Manual manipulations in ROLAP or MOLAP cubes not reflected in OWB metadata
How to Get Started?

• Download OWB 9.2.0.2
  http://otn.oracle.com/software/products/warehouse/content.html
• Install
• Download and install Samples
  http://otn.oracle.com/sample_code/products/warehouse/content.html
• Read Reviewer’s Guide if necessary
• Resources:
  □ OTN
  □ Discussion Forums
QUESTIONS?
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