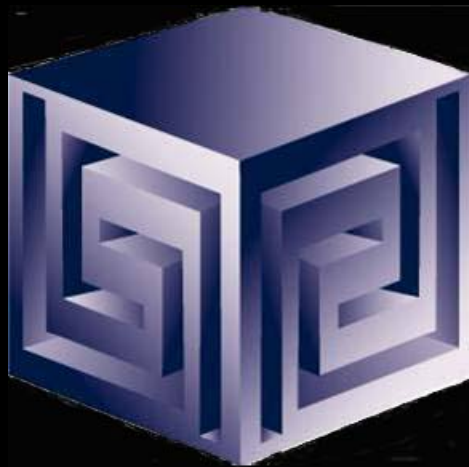


Using Oracle9i Warehouse Builder to create OLAP Warehouses

Oracle World 2003

Session #36921



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Vlamiis 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 Vlamiis 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**

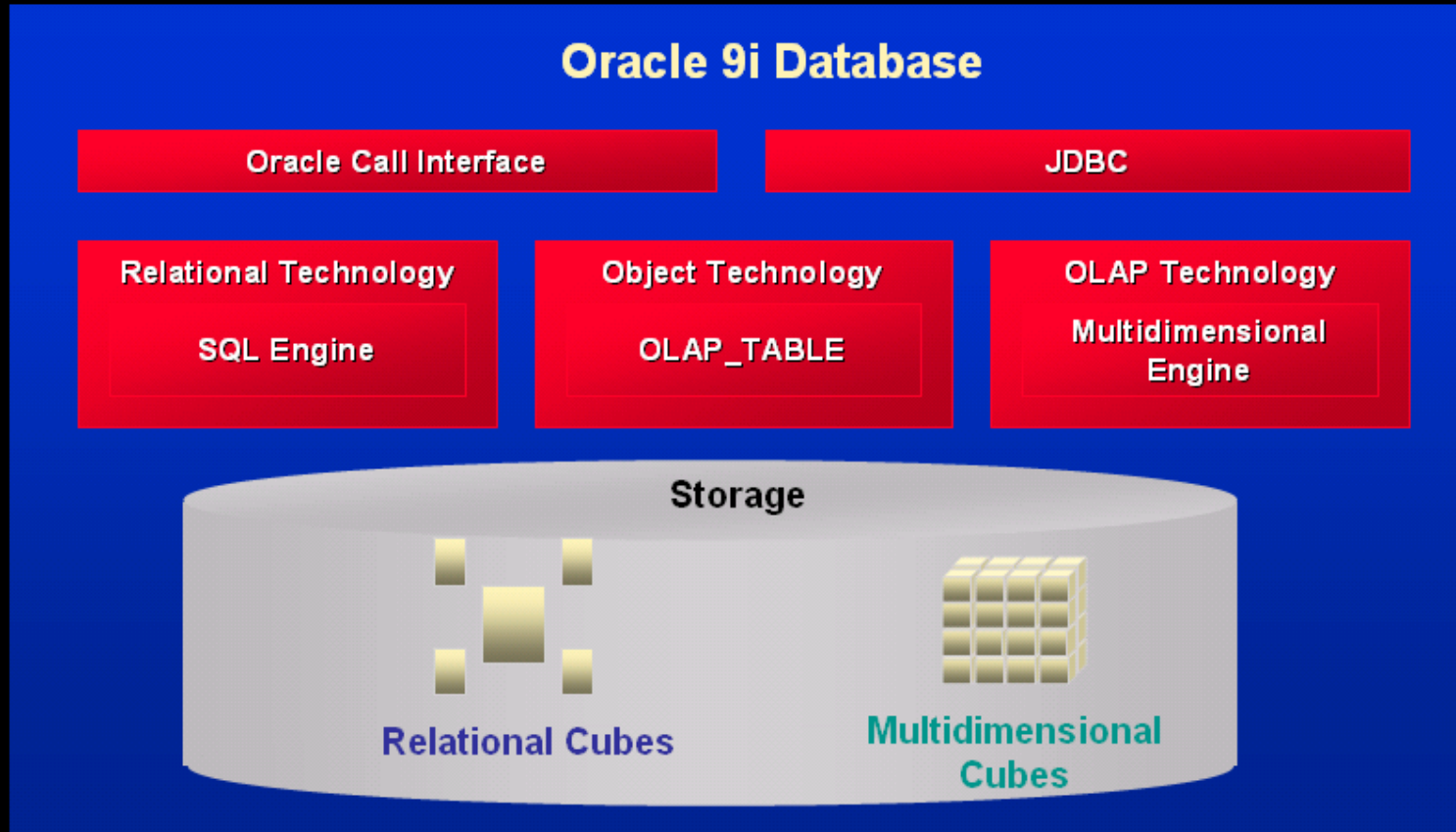


Why a Separate OLAP Tool?

- **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





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 ...)**

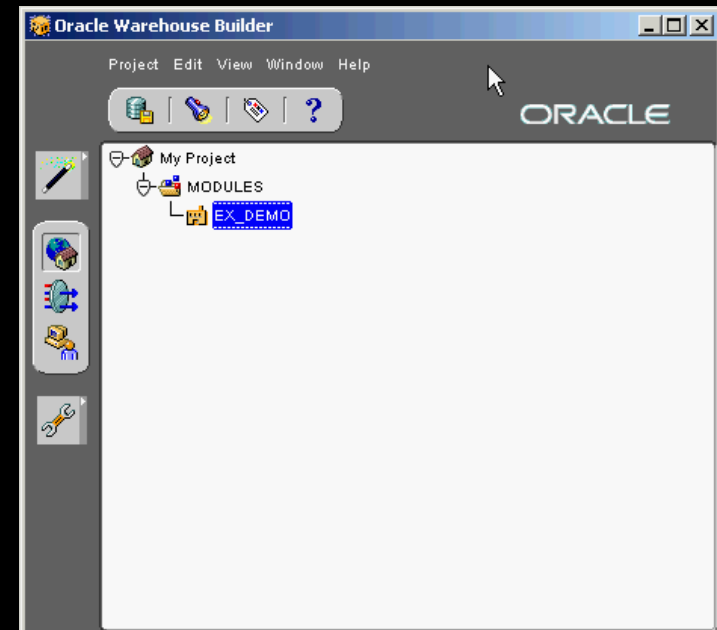


Components: *OWB User Interface*

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 Java API

- **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*

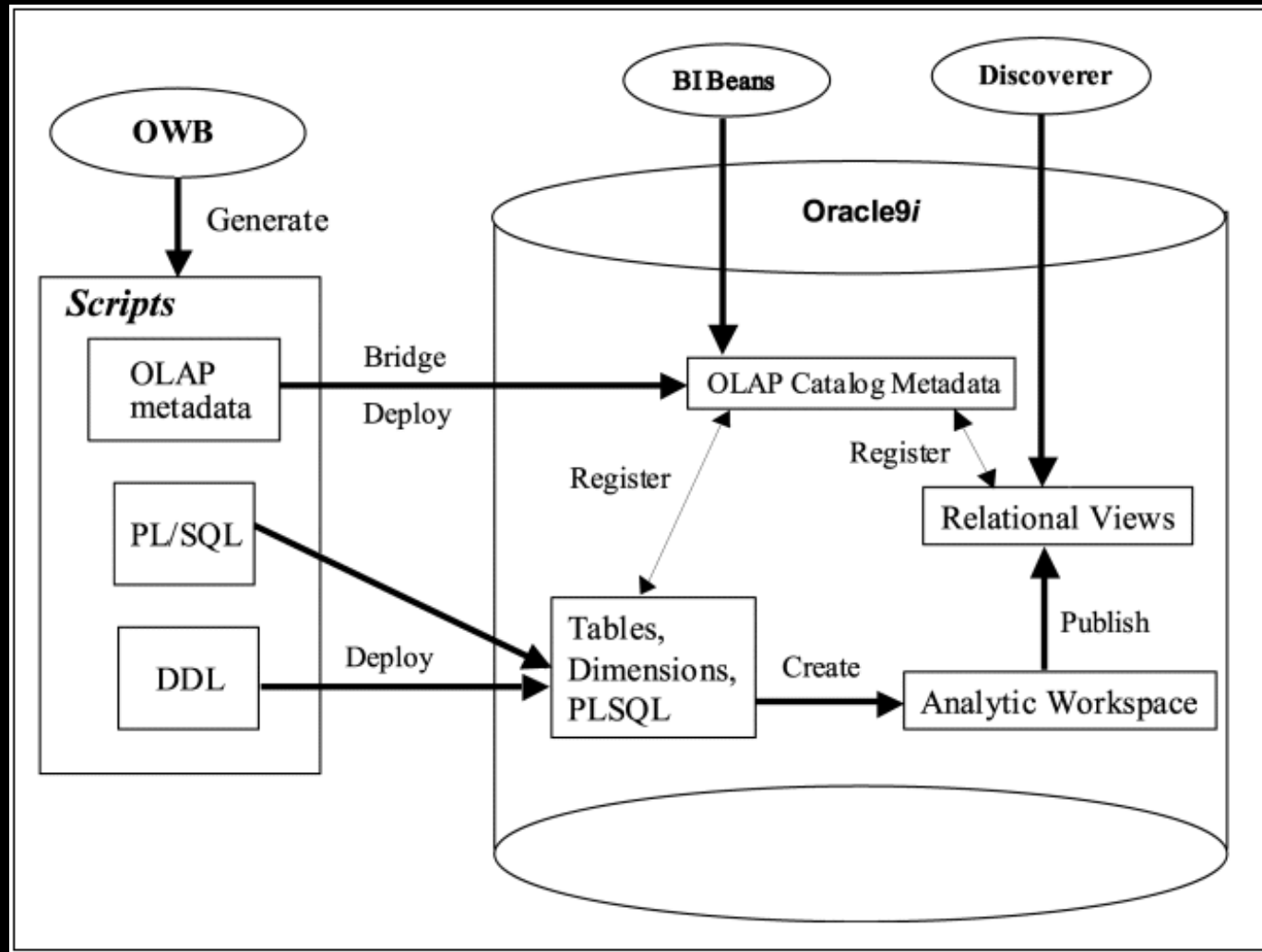
- **Bridging Technology to 9i OLAP, Express, CWM and Discoverer**
- **Supports 9i OLAP as a Source and a Target**
- **No support for Express MOLAP**
- **Only supports Express RAM as a Target**



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)**

OWB OLAP Bridge

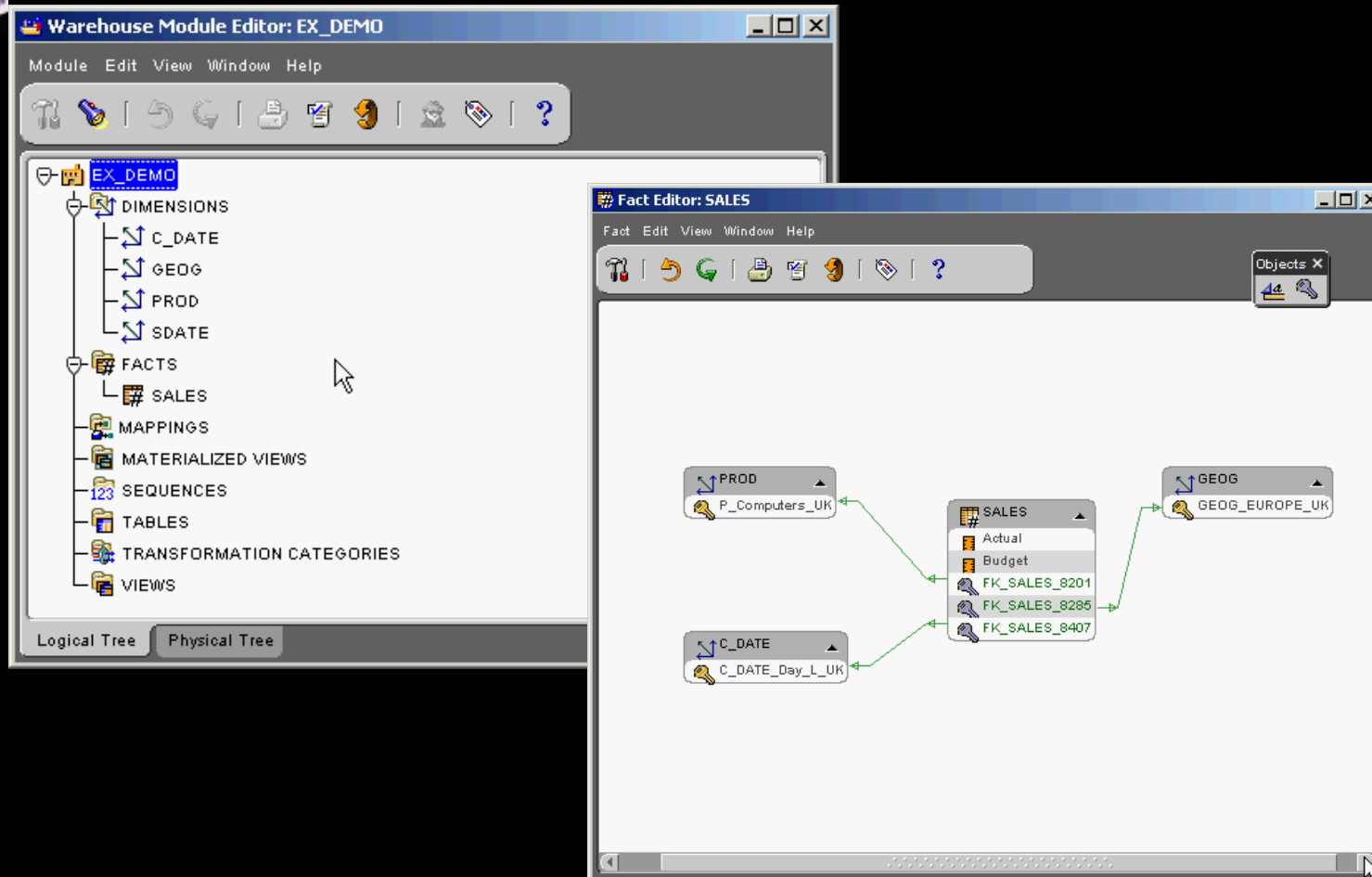




The Process – Building OLAP Cubes

- **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

Physical Level Attribute Name Suffixes in Warehouse Builder	Dimension Attribute Created
_NAME or NAME	Short_Description or Long_Description
_END_DATE or END_DATE	End_Date
_TIME_SPAN or TIME_SPAN	Time_Span
_PRIOR_PERIOD or PRIOR_PERIOD	Prior_Period
_YEAR_AGO_PERIOD or YEAR_AGO_PERIOD	Year_Ago_Period



Creating Dimensions

Table Properties: OWB_TIMEDIM_DATA_TABLE [Read/Write]

Name Columns Constraints Attribute Sets User Defined Properties

Table Columns

Name	Position	Data Type	Length	Precisi...	Scale	Not Null	Note
WEEK_OF_YEAR	15	NUMBER		0	0	<input type="checkbox"/>	
WEEK_START_DA...	16	DATE				<input type="checkbox"/>	
WEEK_END_DATE	17	DATE				<input type="checkbox"/>	
WEEK_TIME_SPAN	18	NUMBER		0	0	<input type="checkbox"/>	
MONTH_ID	19	NUMBER		0	0	<input type="checkbox"/>	
MONTH_OF_QUA...	20	NUMBER		0	0	<input type="checkbox"/>	
MONTH_OF_YEAR	21	NUMBER		0	0	<input type="checkbox"/>	
MONTH_START_D...	22	DATE				<input type="checkbox"/>	
MONTH_END_DATE	23	DATE				<input type="checkbox"/>	
MONTH_TIME_SPAN	24	NUMBER		0	0	<input type="checkbox"/>	
QUARTER_ID	25	NUMBER		0	0	<input type="checkbox"/>	
QUARTER_OF_YE...	26	NUMBER		0	0	<input type="checkbox"/>	

Add Remove

Help OK Cancel



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:

Physical Level Attribute Name Suffixes in Warehouse Builder	Dimension Attribute Created
_YEAR	Year Level
_QUARTER	Quarter Level
_MONTH	Month Level
_DAY	Day Level

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



Time Dimension

Dimension Properties: T_TIME [Read/Write]

Name Levels Level Attributes Hierarchies Level Relationships User Defined Properties

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

Add Update Remove

Help OK Cancel

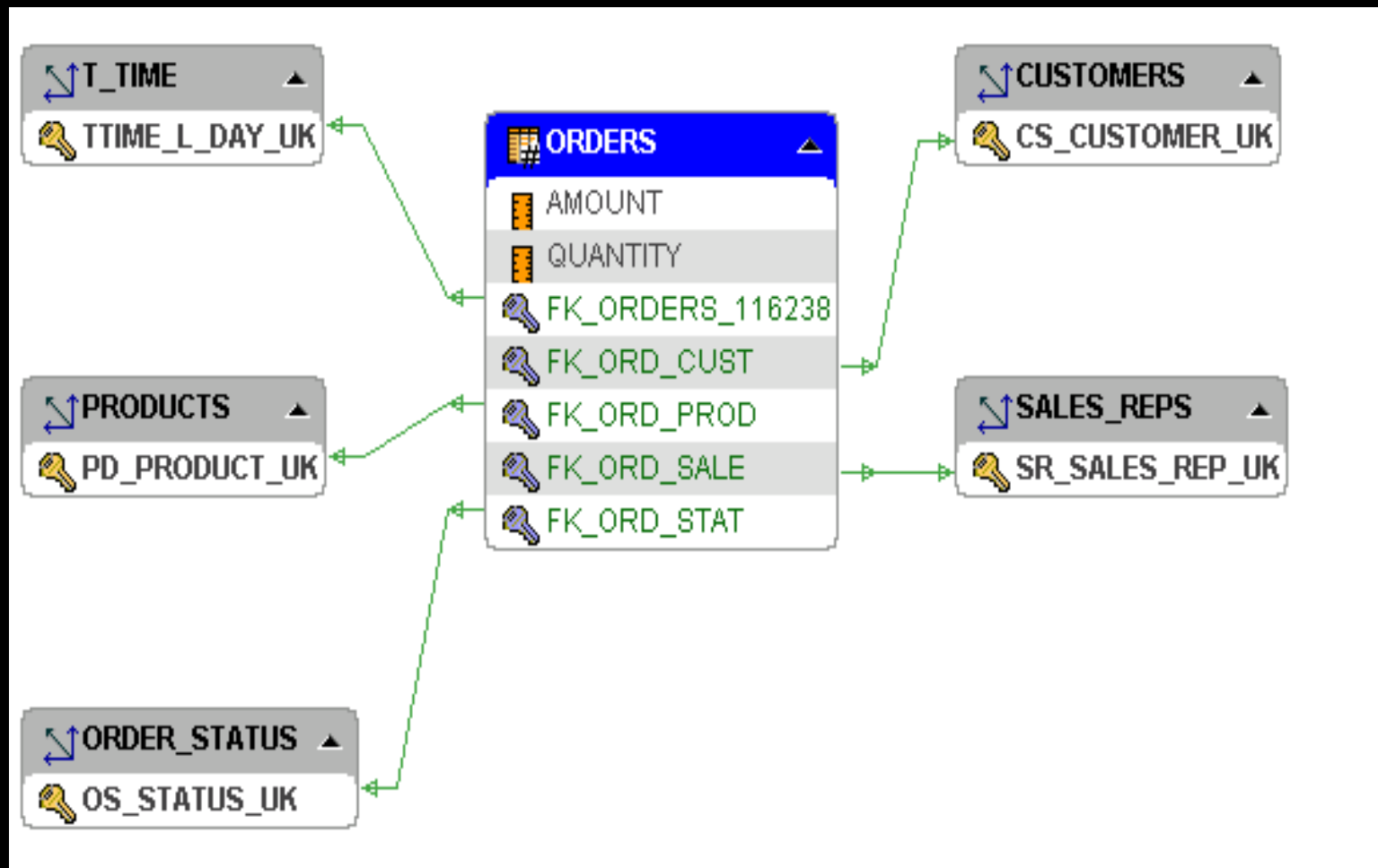


Defining Cubes

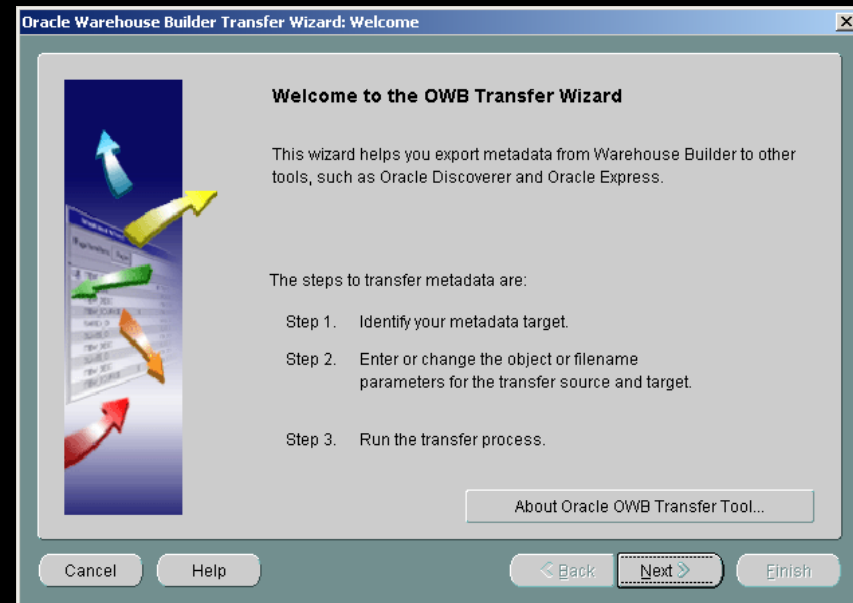
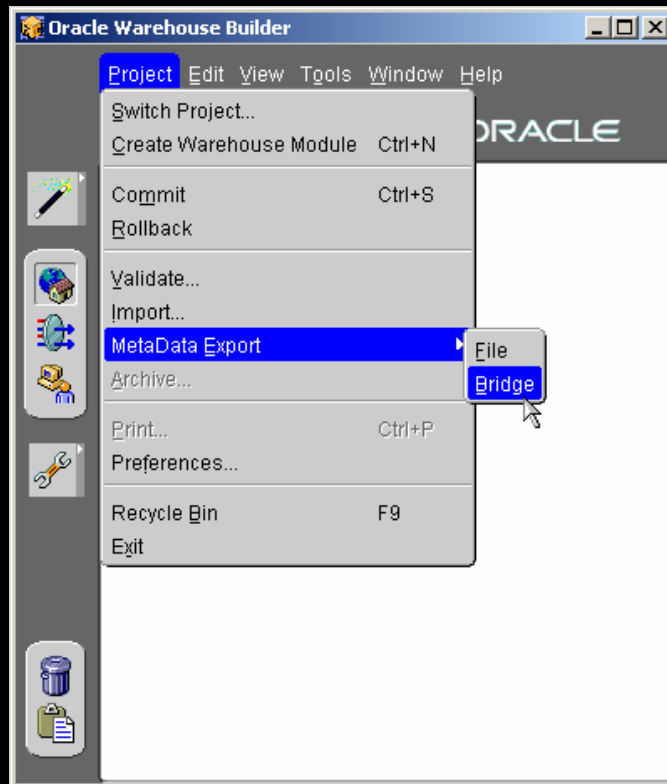
- **Cube is a collection of Measures (Data)**
- **All measures in a cube have the same dimensionality**
- **Use OWB Cube Wizard to build Cubes**



Finished Cube



Metadata Export - Bridge





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

Oracle Warehouse Builder Transfer Wizard, 1 of 3: Metadata Source and Target Identification

Source and Target Metadata Locations

The product that contains the metadata

From:

Select the product where you want to transfer the metadata

To:

Enter a description (optional)

Description

OMG CWM Export
Oracle OLAP Server Import
Oracle Discoverer3
Oracle Express
Oracle Discoverer4

Cancel Help < Back Next > Finish



OLAP Bridge – Transfer Parameters

Oracle Warehouse Builder Transfer Wizard, 2 of 3: Transfer Parameter Identification

Metadata Object/Filenames and Detailed Transfer Parameters

Enter or change the transfer parameter values.

Transfer Parameter Name	Transfer Parameter Value
OWB Exported Business Areas	All Business Areas
Username	BIBDEMO
Password	*****
Hostname	chris-insp4000
Port	1521
SID	orcl
PL/SQL Output File	D:\Projects\IOUGA-2002\IOUGA-2002.sql
Deploy PL/SQL in database	No
Log Level	Information

Cancel Help < Back Next > Finish



OLAP Bridge – Transfer Parameters

Oracle Warehouse Builder Transfer Wizard, 3 of 3: Summary

Confirmation of Oracle WB Transfer

From: To:

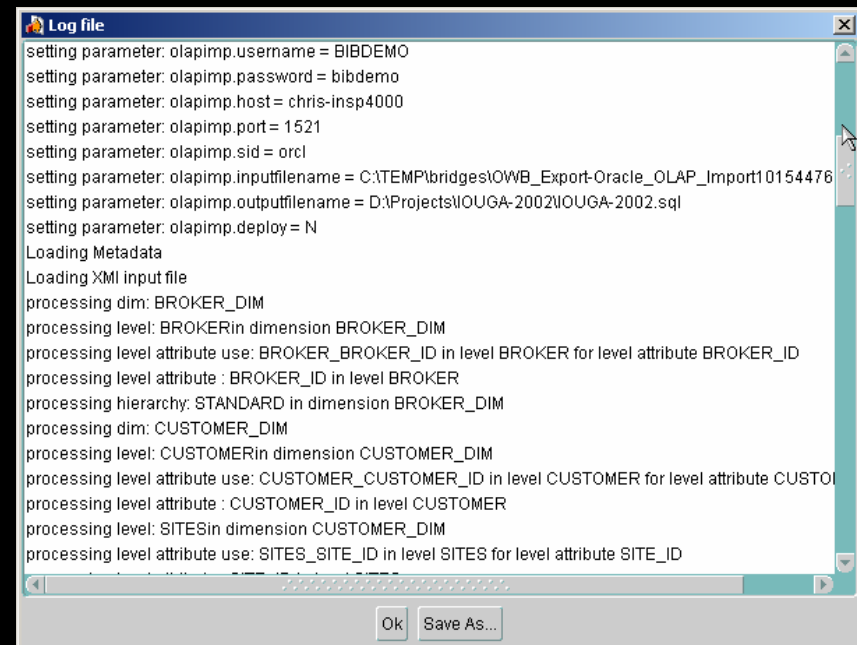
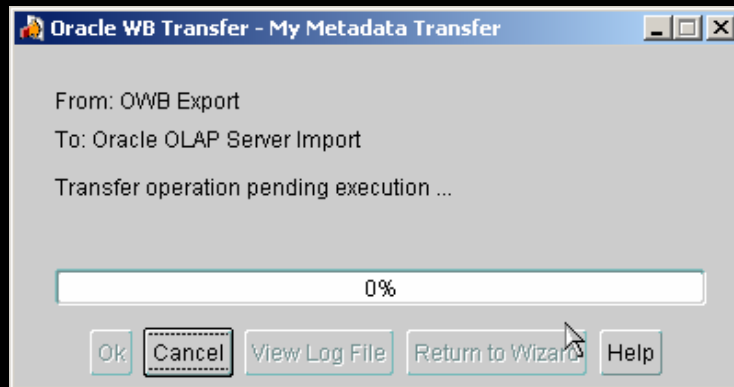
Description:

Transfer Parameter Name	Transfer Parameter Value
OWB Exported Business Areas	All Business Areas
Username	BIBDEMO
Password	*****
Hostname	chris-insp4000
Port	1521
SID	orcl
PL/SQL Output File	D:\Projects\IOUGA-2002\IOUGA-2002.sql

Click Finish to begin the transfer process.



CWM Bridge – Running





OEM Cube Builder – The Results

The screenshot displays the Oracle Enterprise Manager Console Standalone interface. On the left, the 'Network' tree shows the hierarchy: Databases > ORCL > SUN-VSS1 - pitt > OLAP > Cubes > PITT > SALES. The 'SALES' cube is selected. The main pane shows the 'PITT.SALES_FACT' cube configuration. The 'Foreign Keys / Measures' tab is active, showing a list of measures: FK_THROUGHPUT_973, FK_THROUGHPUT_896, FK_ON_SALES_FACT_..., FK_ON_SALES_FACT_T..., BOX_COST, CASES, FREIGHT, LBS, LOH COSTS, MATERIAL_COST, and REVENUE. The 'Dimensions' tab is also visible, showing four dimensions: BROKER, CUSTOMER, GEOGRAPHY, and PRODUCTS. Each dimension has a 'Levels' list: BROKER (SUB_BROKER), CUSTOMER (ALL_CUSTOMERS, CUSTOMER), GEOGRAPHY (ALL_GEOG, REGION), and PRODUCTS (ALL_PRODUCTS, PRODUCT, PRODUCT_CATEGORY). The 'Apply' button is highlighted at the bottom right.



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.

```
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,'ORD  
    ERS',USER,'ORDERS',' month_id>33');
```

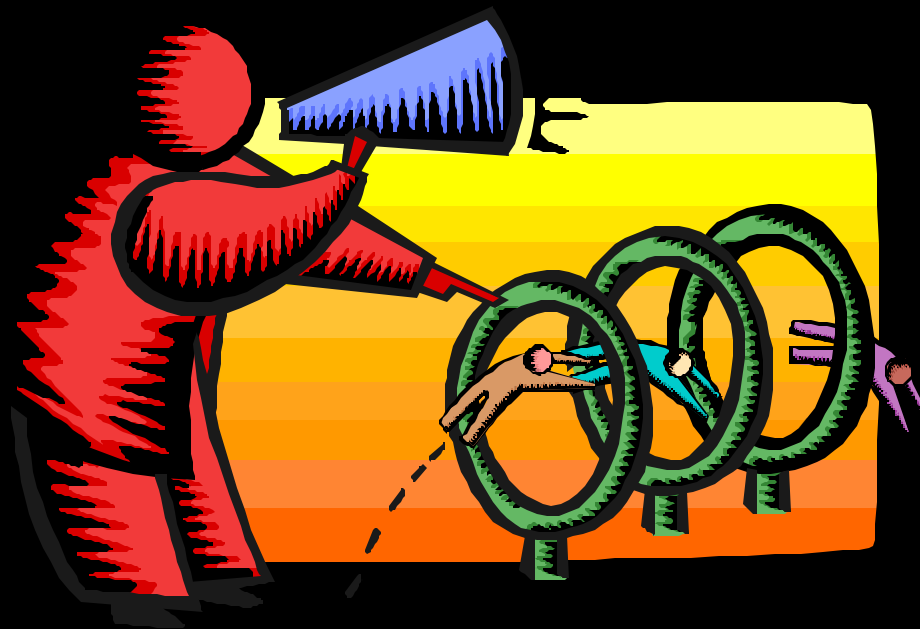
```
  dbms_awm.refresh_awcube (USER, 'AWS', 'AWORDERS', 'ORDERS_FIL');
```

```
  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

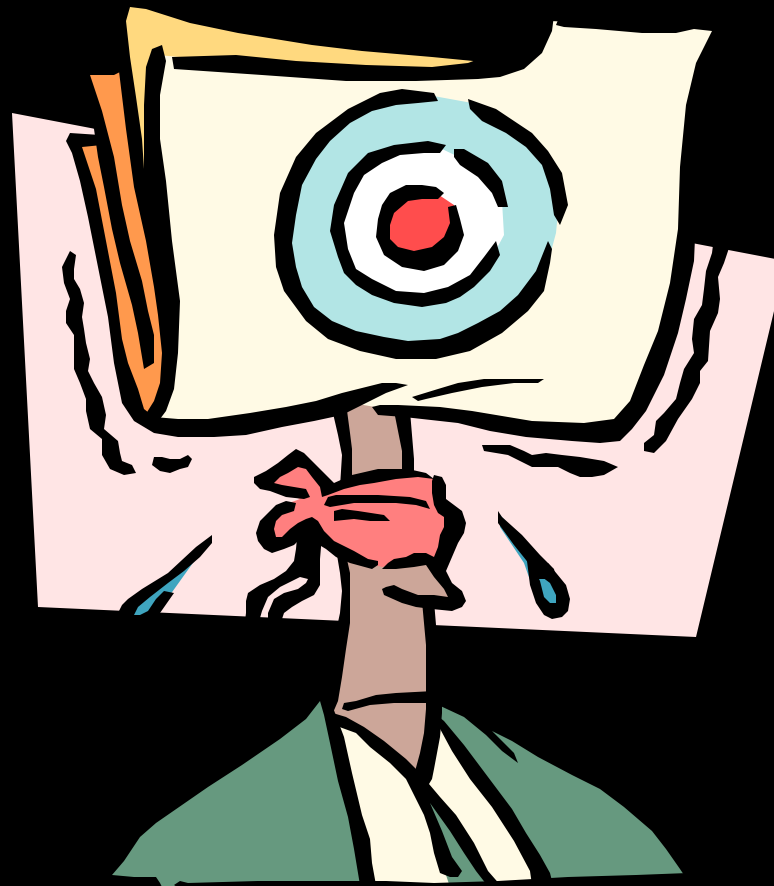
- **We can finally design OLAP Solutions**
- **Support for both ROLAP and MOLAP (AW)**
- **Strong Foundation for the Future**
- **Still Lacking all the Pieces**
 - ❑ **No Bi-Directional Bridge using OEM**
 - ❑ **Manual manipulations in ROLAP or MOLAP cubes not reflected in OWB metadata**



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

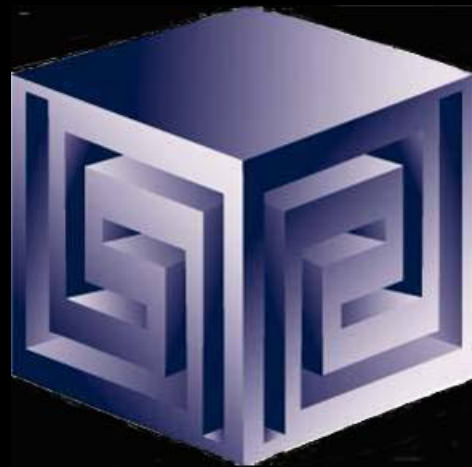
QUESTIONS?



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