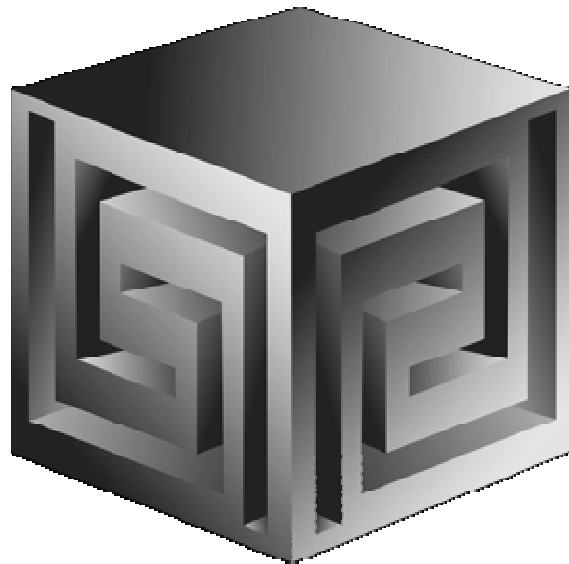


# **Building Cubes and Analyzing Data using Oracle OLAP 11g**

**ODTUG '08  
Session: 7**



**Dan Vlamis**

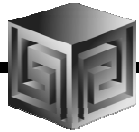
**dvlamis@vlamis.com**

**Vlamis Software Solutions, Inc.**

**816-781-2880**

**<http://www.vlamis.com>**

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# **Vlami Software Solutions, Inc.**

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- **Founded in 1992 in Kansas City, Missouri**
- **Oracle Partner and reseller since 1995**
- **Specializes in ORACLE-based:**
  - ☐ **Data Warehousing**
  - ☐ **Business Intelligence**
  - ☐ **Data Transformation (ETL)**
  - ☐ **Web development and portals**
  - ☐ **Express-based applications**
- **Delivers**
  - ☐ **Design and integrate BI and DW solutions**
  - ☐ **Training and mentoring**
- **Expert presenter at major Oracle conferences**

# Vlami's Kaleidoscope Presentations



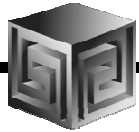
Presenter	Time	Title
Cathye Pendley	Tue 9:15-10:15	Building Cubes and Analyzing Data using Oracle OLAP 11g
Tim Vlami's	Wed 9:15-10:15	Lies, Damn Lies, and Visualizing Data with Oracle BI
Dan Vlami's	Wed 2:45-3:45	Oracle BI, Oracle OLAP, Essbase – The Benefits and Cost of Openness

# **Dan Vlamis, President, Vlamis Software Solutions**



- **Developer for IRI (former owners of Oracle OLAP)**
- **Founded Vlamis Software in 1992**
- **Wrote portions of Oracle Sales Analyzer**
- **Beta tester and early adopter of Oracle OLAP**
- **Expert speaker and author**
- **Recognized expert in Express and OLAP industry**
- **Bringing multi-dim experience to Essbase**

**[dvlamis@vlamis.com](mailto:dvlamis@vlamis.com) 816-781-2880**

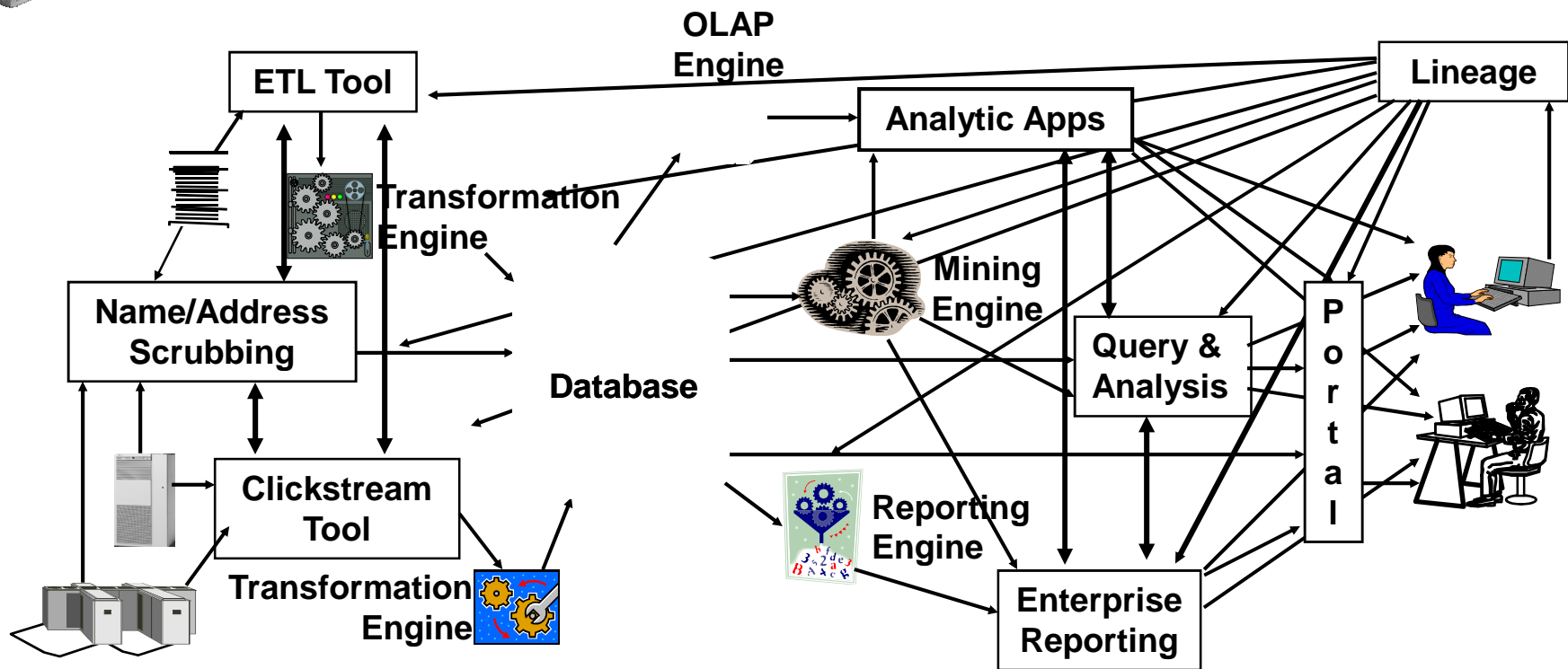
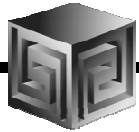


# Agenda

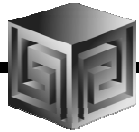
---

- **Why Oracle OLAP?**
- **What is Oracle OLAP?**
- **Oracle OLAP storage options**
- **Structure of Analytic Workspace**
- **Building OLAP Cubes**
- **11g OLAP – what changes?**
- **Conclusions**

# Business Intelligence Market Multi-Vendor, Un-integrated



- Protracted and complex implementation
- Escalating maintenance costs
- Software ***and Metadata*** Integration is key!

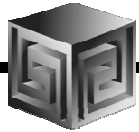


# Definition of OLAP

---

**OLAP** stands for On Line Analytical Processing.  
That has two immediate consequences: the *on line* part requires the answers of queries to be fast, the *analytical* part is a hint that the queries itself are complex.

i.e. Complex Questions with FAST ANSWERS!

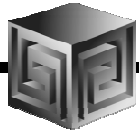


# Why use OLAP?

---

- **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**
- **EASY to IMPLEMENT and SUPPORT!**

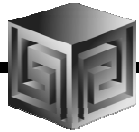




# **What Does Oracle OLAP Add to a DW?**

---

- **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**
- **Platform for extensions**



## **OLAP Option – High-level View**

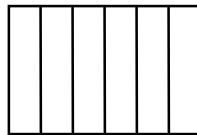
---

- **Advanced analytics**
- **Integrated in RDBMS**
- **Easy to develop**
- **Easy to use**
- **Facilitate collaboration**
- **Flexible deployment**
- **Scaleable and performant**
- **True Relational – Multidimensional database**

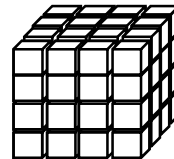
# ROLAP vs. MOLAP



- What is ROLAP? (Relational)
- What is MOLAP? (Multidimensional)
- It's all in how the data is stored

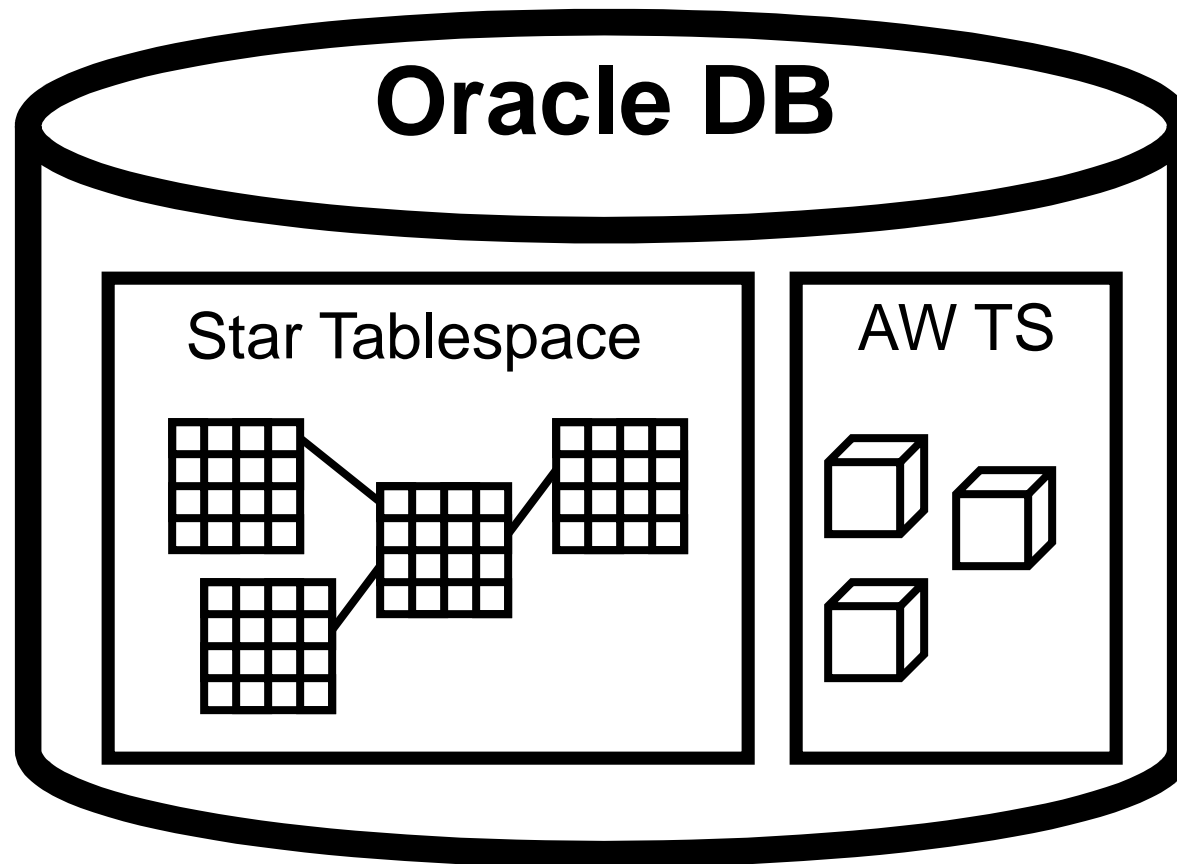


Relational



Multidimensional

# Analytic Workspaces Are Stored in Tablespaces in OLAP





# What is an Analytic Workspace?

Oracle Enterprise Manager Console

File Navigator Object Tools Configuration Help

ORACLE Enterprise Manager

GLOBAL

GLOBAL\_AW

Tables

AW\$GLOBAL

Indexes

Materialized View

Partitions

Triggers

DATE\_TAB

Indexes

Views

Synonyms

Sequences

Clusters

Source Types

User Types

HR

General Constraints Storage Options LOB Storage Statistics

Name: AW\$GLOBAL

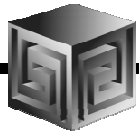
Schema: GLOBAL\_AW

Tablespace: GLOBAL\_AW

Table: ☒ Standard ☐ Organized Using Index (IOT)

Columns

Name	Datatype	Size	Scale	Nulls?
PS#	NUMBER	10	0	✓
GEN#	NUMBER	10	0	✓
EXTNUM	NUMBER	8	0	✓
AWLOB	BLOB			✓
OBJNAME	VARCHAR2	60		✓
PARTNAME	VARCHAR2	60		✓



# Managing Analytic Workspaces

Analytic Workspace Manager dantoshm2:1521:orcl Model View

File View Tools Help

GLOBAL  
GLOBAL\_AW  
Analytic Workspaces  
GLOBAL (attached RW)  
Dimensions  
CHANNEL  
Levels  
TOTAL\_CH  
CHANNEL  
Hierarchies  
Attributes  
Mappings  
CUSTOMER  
PRODUCT  
TIME  
Cubes  
SALES\_CUBE  
Measures  
Calculated Mea  
Mappings  
PRICE\_AND\_COST  
Measure Folders

Dimensions:

Name	Long Description	Type
CHANNEL	Channel	User
CUSTOMER	Customer	User
PRODUCT	Product	User
TIME	Time	Time

Cubes:

Name	Long Descri...	Dimensions
SALES_CUBE	Sales Cube	TIME,CUSTOMER,PRODUCT,CHANNEL
PRICE_AND_CO...	PRICE AND ...	TIME,PRODUCT

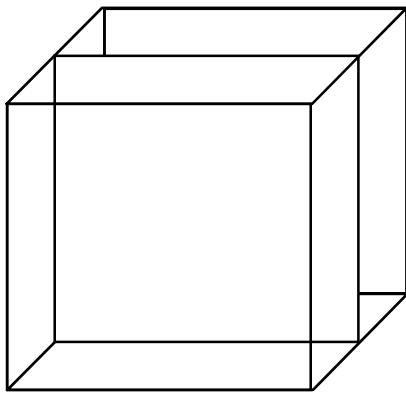
Measures:

Name	Cube
SALES	SALES_CUBE
UNITS	SALES_CUBE
BASE_COST	SALES_CUBE
COST	SALES_CUBE
BASE_PRICE	SALES_CUBE

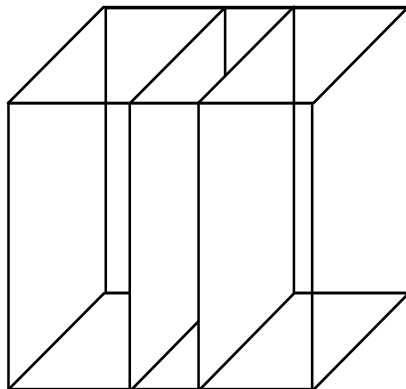
# OLAP AW Stores Data in Cubes



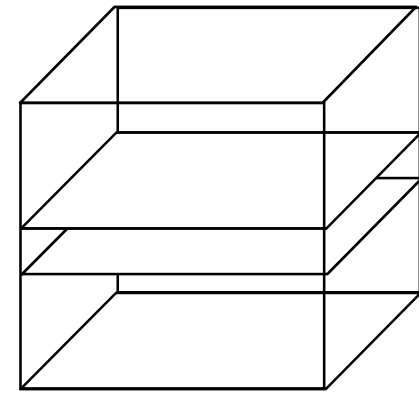
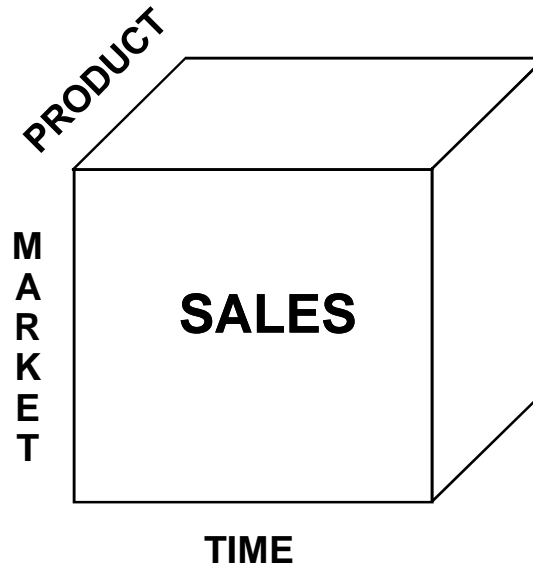
*Fast Flexible Access to Summarized Data*



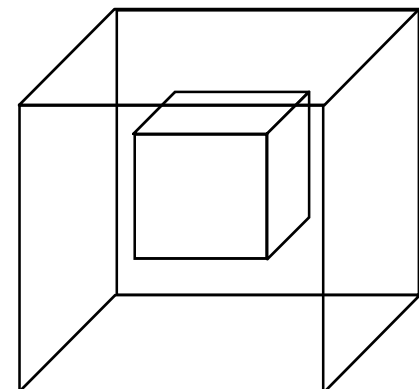
**Product Mgr. View**



**Financial Mgr. View**

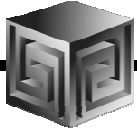


**Regional Mgr. View**



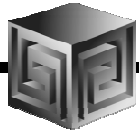
**Ad Hoc View**

# **What Are AW Cubes?**



- **Data stored as arrays**
- **Dimension values are internally integers**
- **Offset calculated using simple multiplication**
- **Offset tells exactly where to look for data**
- **Pages and segmentation complicate design**
- **Conjoints and composites handle sparsity**

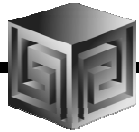




# Dimensions

## Definition:

- **Dimensions are collections of keys or lookup values that allow for querying and subsetting data.**
- **Dimensions can be flat, parent-child or hierarchical in nature**
- **Examples:**
  - ☐ **Time (year,quarter, month, day)**
  - ☐ **Geograpy (continent,region,country,state)**
  - ☐ **Product(all products, division, group, class, item)**



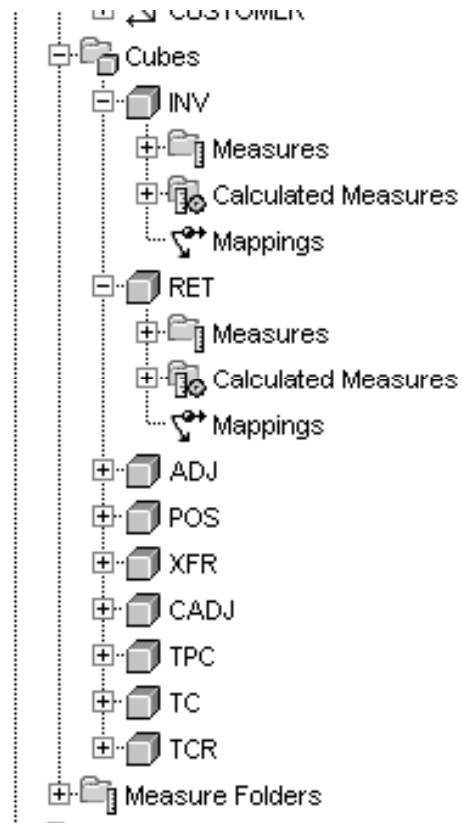
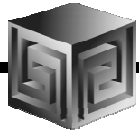
# Cubes Defined

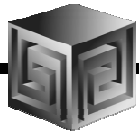
---

## Definition:

- **Cubes are collections of measures. They are a logical way to organize data. All measures in a cube share the same dimensionality**
- **Examples:**
  - ☐ **Sales\_Cube (with Units, Dollars, Profit)**
  - ☐ **Finance\_Cube (with Actual, Budget, Variance)**

# Cubes in AWM





# Define Measures

Analytic Workspace Manager cc-m2:1521:orc110 Model View

File View Tools Help

INTERNET\_APPSERVER\_REGISTRY  
IP  
LEV\_AW  
Analytic Workspaces  
LEV\_AW (attached RW)  
Dimensions  
REASONS  
TIME  
PRODUCT  
CUSTOMER  
Cubes  
INV  
Measures  
GROSS\_SALES  
GROSS\_UNITS  
GROSS\_COGS  
Calculated Measures  
Mappings  
RET  
Measures  
Calculated Measures  
Mappings  
ADJ  
POS  
XFR  
CADJ  
TPC  
TC  
TCR  
Measure Folders  
LEV\_PROGRAMS  
LEV\_DBA  
MDDATA  
MDSYS  
MGMT\_VIEW

General Implementation Details Rules Summarize To Cache

Specify General Measure Information

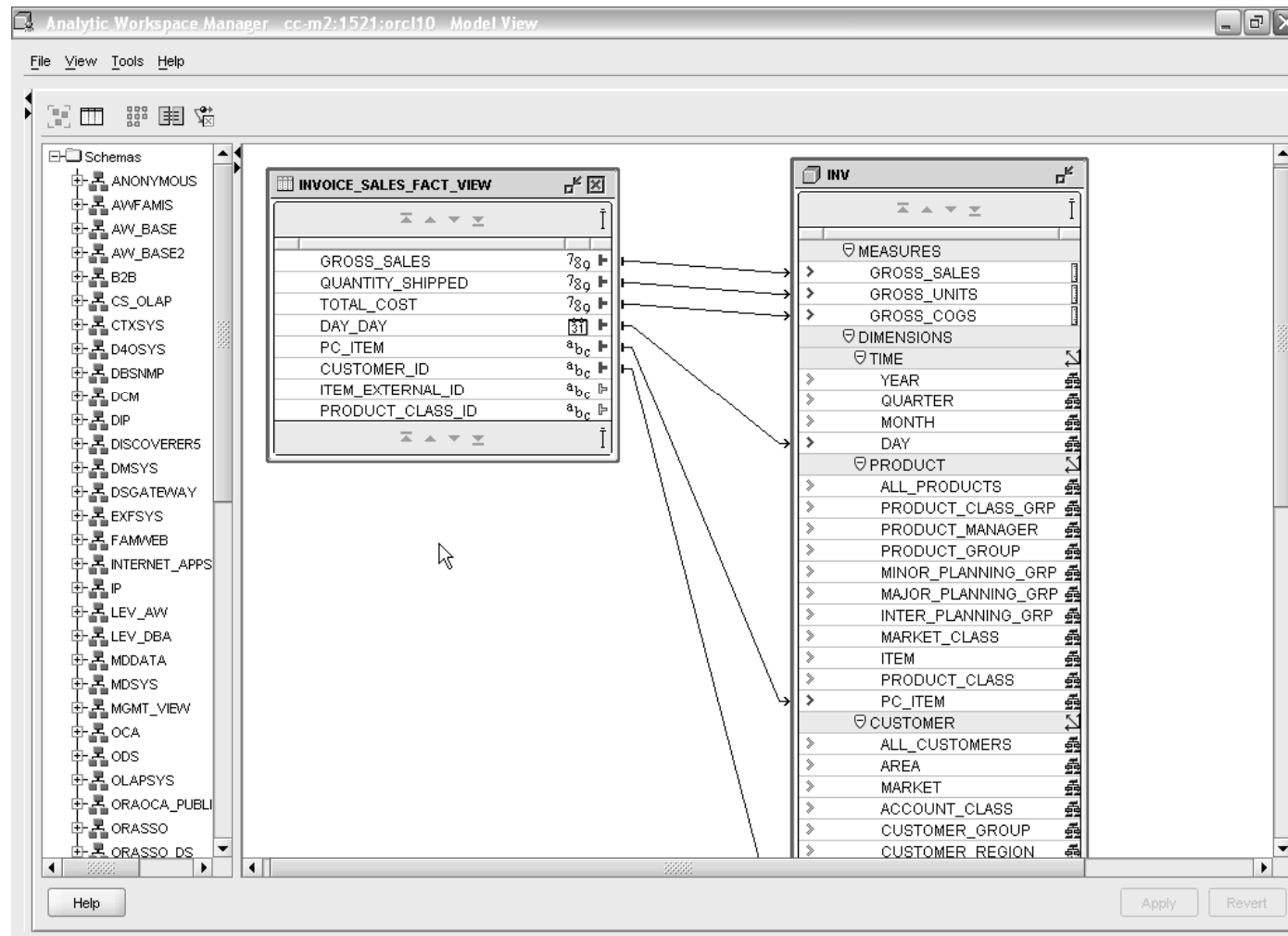
Name: GROSS\_SALES  
ID: INV.GROSS\_SALES.MEASURE  
Short Label: Gross Sales  
Long Label: Gross Sales  
Description: Gross Sales

☐ Use Aggregation specification from the cube  
☒ Override the Aggregation specification of the cube

Help Apply Revert



# Map Cube



# Maintaining Dims/Cubes



**Maintenance Wizard: Select objects**

Choose dimensions to be maintained for analytic workspace LEV\_AW.LEV\_AW

Available Target Objects

- Dimensions
- Cubes

Selected Target Objects

- Dimensions
- PRODUCT

☒ Add the Dimension

Help

**Maintenance Wizard: Analytic Workspace task processing options (LEV\_AW.LEV\_AW)**

Choose how and when the maintenance task is processed.

☒ Run maintenance task immediately in this session

☐ Submit the maintenance task to the Oracle Job Queue

☐ Run Immediately

☒ Run at a future time

Date and Time: 03/28/2005 19:30:35

Maximum number of parallel processes: 1

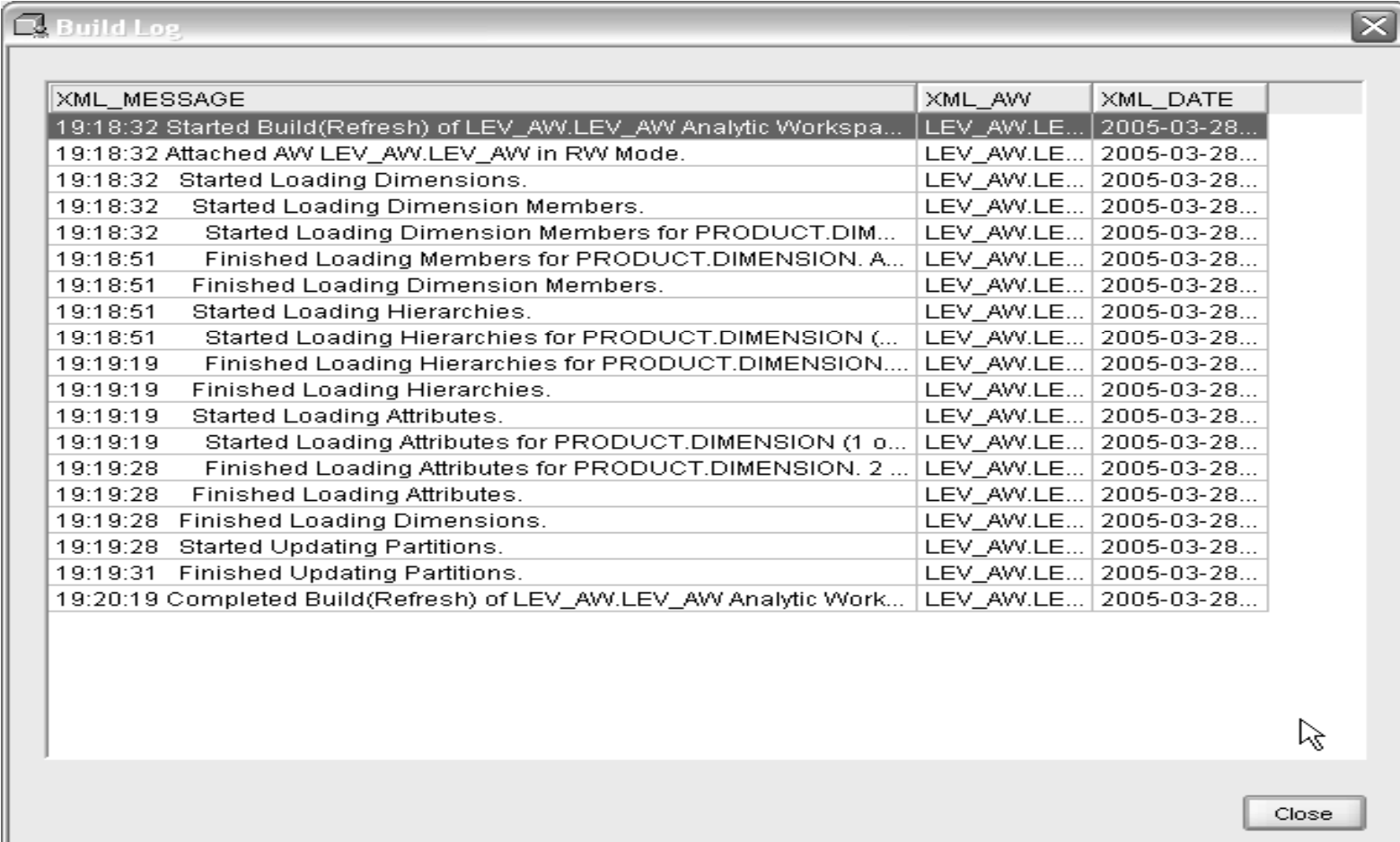
☐ Save maintenance task to script

File Name:

Help < Back Next Finish Cancel

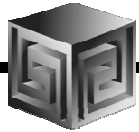


# Maintaining Dims/Cubes



The screenshot shows a 'Build Log' window with a table of messages. The table has three columns: XML\_MESSAGE, XML\_AW, and XML\_DATE. The messages describe the steps of a build process, including starting and finishing loading dimensions, dimension members, hierarchies, and attributes, as well as updating partitions. The build is completed at 19:20:19.

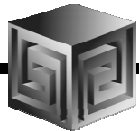
XML_MESSAGE	XML_AW	XML_DATE
19:18:32 Started Build(Refresh) of LEV_AW.LEV_AW Analytic Workspa...	LEV_AW.LE...	2005-03-28...
19:18:32 Attached AW LEV_AW.LEV_AW in RW Mode.	LEV_AW.LE...	2005-03-28...
19:18:32 Started Loading Dimensions.	LEV_AW.LE...	2005-03-28...
19:18:32 Started Loading Dimension Members.	LEV_AW.LE...	2005-03-28...
19:18:32 Started Loading Dimension Members for PRODUCT.DIM...	LEV_AW.LE...	2005-03-28...
19:18:51 Finished Loading Members for PRODUCT.DIMENSION. A...	LEV_AW.LE...	2005-03-28...
19:18:51 Finished Loading Dimension Members.	LEV_AW.LE...	2005-03-28...
19:18:51 Started Loading Hierarchies.	LEV_AW.LE...	2005-03-28...
19:18:51 Started Loading Hierarchies for PRODUCT.DIMENSION (...)	LEV_AW.LE...	2005-03-28...
19:19:19 Finished Loading Hierarchies for PRODUCT.DIMENSION....	LEV_AW.LE...	2005-03-28...
19:19:19 Finished Loading Hierarchies.	LEV_AW.LE...	2005-03-28...
19:19:19 Started Loading Attributes.	LEV_AW.LE...	2005-03-28...
19:19:19 Started Loading Attributes for PRODUCT.DIMENSION (1 o...	LEV_AW.LE...	2005-03-28...
19:19:28 Finished Loading Attributes for PRODUCT.DIMENSION. 2 ...	LEV_AW.LE...	2005-03-28...
19:19:28 Finished Loading Attributes.	LEV_AW.LE...	2005-03-28...
19:19:28 Finished Loading Dimensions.	LEV_AW.LE...	2005-03-28...
19:19:28 Started Updating Partitions.	LEV_AW.LE...	2005-03-28...
19:19:31 Finished Updating Partitions.	LEV_AW.LE...	2005-03-28...
19:20:19 Completed Build(Refresh) of LEV_AW.LEV_AW Analytic Work...	LEV_AW.LE...	2005-03-28...



# Looking at OLAP 11g

- Oracle 11g is currently Available limited to SQL access today!
- Oracle OLAP has many NEW things
  - ☐ New CUBE\_TABLE function in SQL
  - ☐ Tight integration with SQL  
(automatically generated views)
  - ☐ Tight integration with data dictionary
  - ☐ New Calc Wizard in AWM!
  - ☐ Easier to use and deploy
  - ☐ Ability to use OLAP for Materialized views  
(get MUCH FASTER response times!)





# OLAP 11g Changes

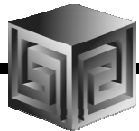
- **New CUBE\_TABLE function simplifies access to AW data (replacing OLAP\_TABLE)**

The screenshot displays the Oracle SQL Developer interface. On the left, the 'Connections' tree shows a hierarchy: Amazon > stack07 - global > stack07 - global - main3 > Views > CUSTOMER\_SHIPMENTS\_VIEW. The main window shows the 'Enter SQL Statement' editor with the following query:

```
SELECT * FROM TABLE(CUBE_TABLE('GLOBAL.CUSTOMER;SHIPMENTS'));
```

Below the editor, the 'Results' tab is active, showing a table with 6 columns: REGION, WAREHOUSE, SHIP\_TO, LEVEL\_NAME, and LONG\_DESCRIPTOR. The results are as follows:

	REGION	WAREHOUSE	SHIP_TO	LEVEL_NAME	LONG_DESCRIPTOR
1	(null)	(null)	REGION	Europe	
2	(null)	(null)	REGION	North America	
3	(null)	(null)	REGION	Asia Pacific	
4	20	99	SHIP_TO	UK Env Dept Glasgow	



# OLAP 11g Changes

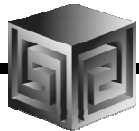
- Views automatically created for SQL access to AWs – Dimensions and Cubes!

The screenshot displays the Oracle SQL Developer interface. On the left, the 'Connections' tree shows a hierarchy: 'stack07 - global - main3' > 'Tables' > 'Views' > 'CUSTOMER\_SHIPMENTS\_VIEW'. The 'CUSTOMER\_SHIPMENTS\_VIEW' is expanded, showing its columns: DIM\_KEY, LEVEL\_NAME, PARENT, TOTAL\_CUSTOMER, REGION, WAREHOUSE, and SHIP\_TO. On the right, the 'SQL' tab is active, showing the following SQL script:

```
REM START GLOBAL CUSTOMER_SHIPMENTS_VIEW

CREATE OR REPLACE FORCE VIEW "GLOBAL"."CUSTOMER_SHIPMENTS_VIEW"
SELECT
    "DIM_KEY",
    "LEVEL_NAME",
    "PARENT" /* ,
    "DEPTH" */,
    "TOTAL_CUSTOMER",
    "REGION",
    "WAREHOUSE",
    "SHIP_TO"
FROM TABLE(CUBE_TABLE('GLOBAL.CUSTOMER;SHIPMENTS'))

REM END GLOBAL CUSTOMER_SHIPMENTS_VIEW
```

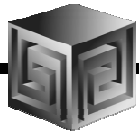


# OLAP 11g Changes

- Views easily accessed from SQL Developer

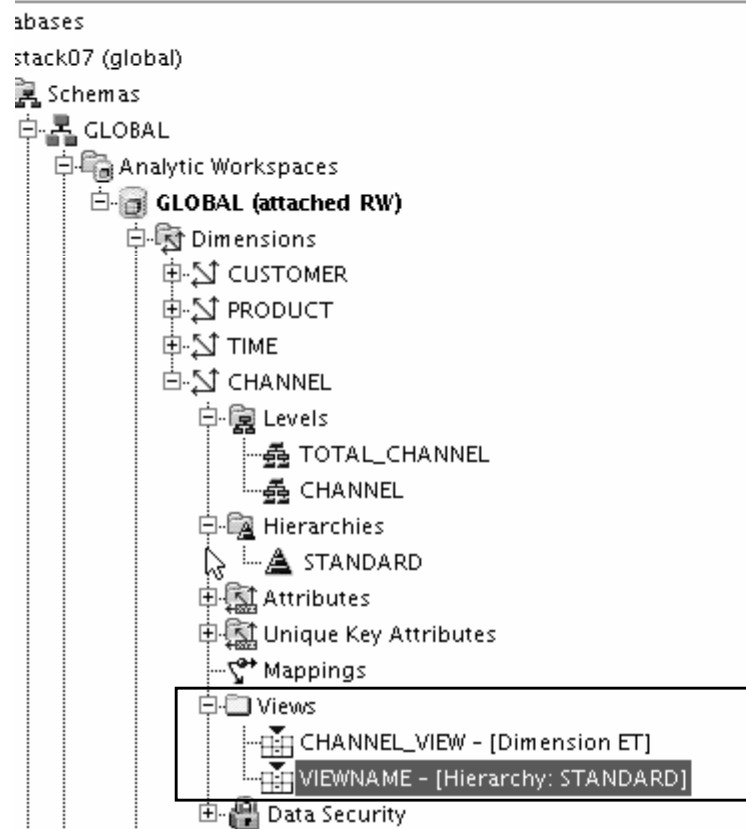
The screenshot shows the SQL Developer interface. On the left, the 'Connections' pane shows a tree structure with 'Amazon' > 'stack07 - global' > 'stack07 - global - main3' > 'Views' > 'CUSTOMER\_SHIPMENTS\_VIEW'. The main pane shows the 'Data' tab for 'CUSTOMER\_SHIPMENTS\_VIEW'. The data is displayed in a table with the following columns: DIM\_KEY, LEVEL\_NAME, PARENT, TOTAL\_CUSTOMER, REGION, WAREHOUSE, and SHIP\_TO. The table contains 16 rows of data.

DIM_KEY	LEVEL_NAME	PARENT	TOTAL_CUSTOMER	REGION	WAREHOUSE	SHIP_TO
1 9	REGION	1	1	9	(null)	(null)
2 10	REGION	1	1	10	(null)	(null)
3 8	REGION	1	1	8	(null)	(null)
4 99	SHIP_TO	20	1	9	20	99
5 46	SHIP_TO	21	1	10	21	46
6 89	SHIP_TO	21	1	10	21	89
7 59	SHIP_TO	21	1	10	21	59
8 91	SHIP_TO	20	1	9	20	91
9 90	SHIP_TO	21	1	10	21	90
10 49	SHIP_TO	16	1	9	16	49
11 95	SHIP_TO	21	1	10	21	95
12 72	SHIP_TO	11	1	8	11	72
13 47	SHIP_TO	14	1	9	14	47
14 60	SHIP_TO	18	1	8	18	60
15 74	SHIP_TO	15	1	8	15	74
16 75	SHIP_TO	16	1	9	16	75



# OLAP 11g Changes

- Automatic views accessible from AWM



General

Specify View Information

Dimension Name: CHANNEL

Hierarchy Name: STANDARD

View Name:

Column Name	Data Type	Object Type
DIM_KEY	VARCHAR2	Key
LEVEL_NAME	VARCHAR2	Level Name
PARENT	VARCHAR2	Parent
TOTAL_CHANNEL	VARCHAR2	Hierarchy Level
CHANNEL	VARCHAR2	Hierarchy Level



# OLAP 11g Changes

- Query Rewrite knows about AWs now

General Translations Implementation Details **Materialized Views** Rules Summarize To Cache

Choose this option to manage refresh of the cube with the Materialized View refresh system

☐ Enable Materialized View Refresh of the cube

Choose how and when to refresh of the cube with the Materialized View refresh system

Refresh Method: Force Refresh Mode: On Demand

Start With:  Modify...

Next Refresh:  Modify...

Constraints: ☒ Trusted ☐ Enforced

☐ Parallel: Degree of Parallelism:

Choose this option to allow queries on the source tables of the cube to be automatically rewritten to use summary data in the cube

☐ Enable the Query Rewrite Materialized View

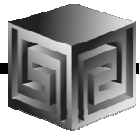
Materialized View Implementation Details

Refresh Rewrite

☒ Compatibility Check list

☐ Materialized View details

Status	Object	Check
--------	--------	-------



# OLAP 11g Changes

- Optimizer pushes joins down to AW
- Enables efficient non-OLAP-aware SQL queries

The screenshot displays the Oracle SQL Developer interface. The top pane shows an SQL query:

```
FROM time_view t,  
product_view p,  
customer_view cu,  
channel_view ch,  
units_cube_view f  
WHERE t.dim_key = f.TIME  
AND p.dim_key = f.product  
AND cu.dim_key = f.customer  
AND ch.dim_key = f.channel  
AND t.long_description = '2000'  
AND p.long_description = 'Total Product'  
AND cu.long_description = 'All Customers'
```

The bottom pane shows the execution plan for the query. The 'Explain' tab is selected. The plan is as follows:

Operation	Optimizer	Cost	Cardinality	Bytes	Part
SELECT STATEMENT	ALL_ROWS	1028	1	520	
HASH JOIN		1028	1	520	
MERGE JOIN(CARTESIAN)		407	1	380	
MERGE JOIN(CARTESIAN)		305	1	240	
MERGE JOIN(CARTESIAN)		203	1	160	
CUBE SCAN(OUTER) GLOBAL.CHANNEL					
BUFFER(SORT)		102	1	80	
CUBE SCAN(OUTER) GLOBAL.PRODUCT					
BUFFER(SORT)		102	1	80	

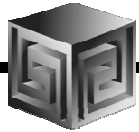


# OLAP 11g Changes

- Views are stored in Oracle Dictionary
- Notice in SYS.USER\_DIMENSION\_VIEWS

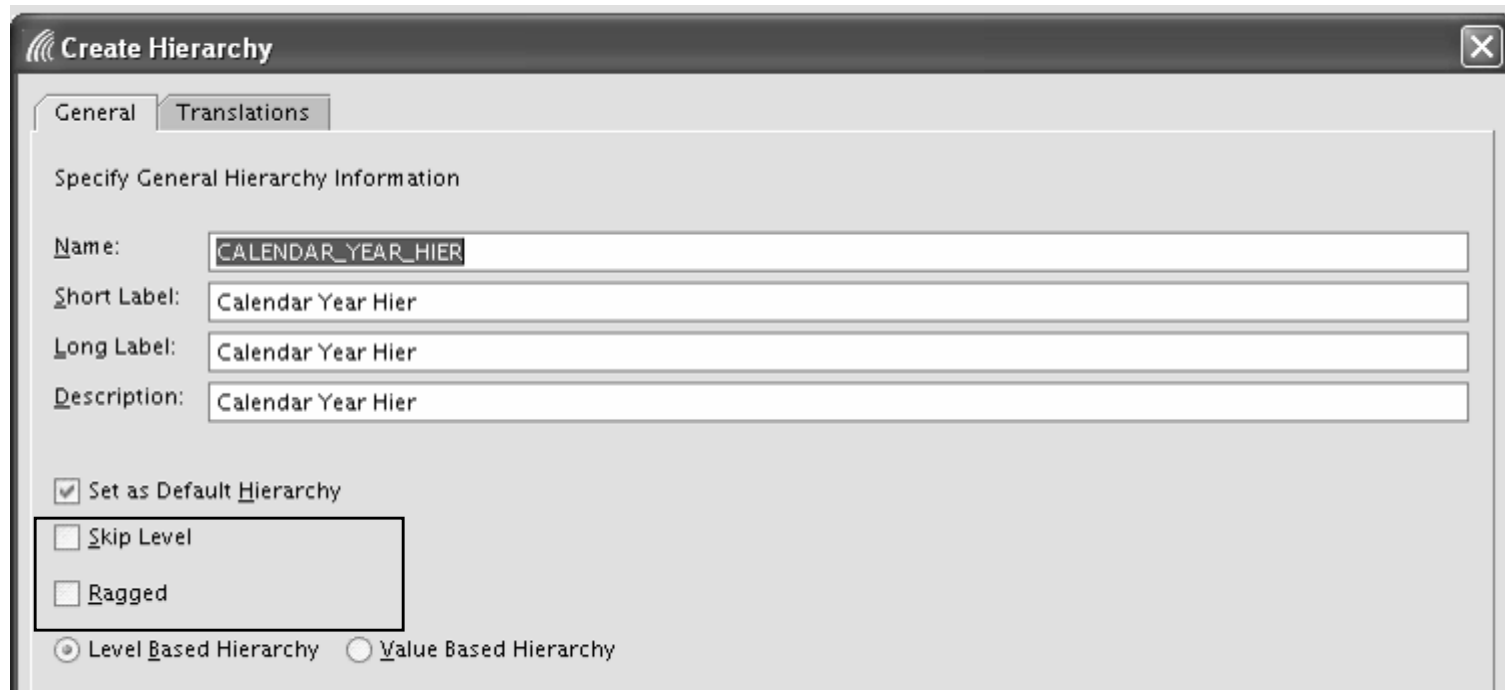
The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' tree is expanded to show the 'stack07 - global - main3' connection, with the 'Views' folder selected. The main window displays the 'CUSTOMER\_SHIPMENTS\_VIEW' tab. The 'Enter SQL Statement' area contains the query: `select * from sys.user_dimension_views;`. The 'Results' tab is active, showing a table with 4 rows and 4 columns: DIMENSION\_NAME, VIEW\_OWNER, VIEW\_NAME, and VIEW\_TYPE. The results are as follows:

	DIMENSION_NAME	VIEW_OWNER	VIEW_NAME	VIEW_TYPE
1	TIME	GLOBAL	TIME_VIEW	ET
2	CHANNEL	GLOBAL	CHANNEL_VIEW	ET
3	PRODUCT	GLOBAL	PRODUCT_VIEW	ET
4	CUSTOMER	GLOBAL	CUSTOMER_VIEW	ET



# OLAP 11g Changes

- Native support for AWs with skip level and ragged hierarchies

A screenshot of the 'Create Hierarchy' dialog box in Oracle OLAP 11g. The dialog has a title bar with a close button. It contains two tabs: 'General' (selected) and 'Translations'. Under the 'General' tab, there is a section titled 'Specify General Hierarchy Information'. This section contains four text input fields: 'Name' (containing 'CALENDAR\_YEAR\_HIER'), 'Short Label' (containing 'Calendar Year Hier'), 'Long Label' (containing 'Calendar Year Hier'), and 'Description' (containing 'Calendar Year Hier'). Below these fields are three checkboxes: 'Set as Default Hierarchy' (checked), 'Skip Level' (unchecked), and 'Ragged' (unchecked). At the bottom, there are two radio buttons: 'Level Based Hierarchy' (selected) and 'Value Based Hierarchy' (unselected).

Create Hierarchy

General Translations

Specify General Hierarchy Information

Name: CALENDAR\_YEAR\_HIER

Short Label: Calendar Year Hier

Long Label: Calendar Year Hier

Description: Calendar Year Hier

☒ Set as Default Hierarchy

☐ Skip Level

☐ Ragged

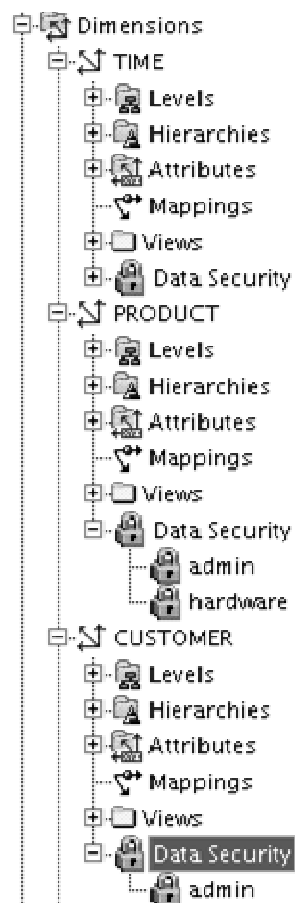
☒ Level Based Hierarchy ☐ Value Based Hierarchy





# OLAP 11g Changes

- Create security policies based on hierarchies



The 'Create Data Security Policy' dialog box is shown with the 'Member Selection' tab selected. It displays the 'Available' hierarchy and the 'Selected' members.

**Available:**

- Hierarchy
  - Descendants of Hardware
  - TOTAL\_CUSTOMER

**Selected:**

- 1. Start with Hardware
- 2. Add Descendants of Hardware

**Condition Expression:**

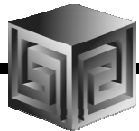
```
GLOBAL.PRODUCT.DIM_KEY IN ('2') OR '2'  
GLOBAL.PRODUCT.PRIMARY LEVEL GLOBAL
```

**Create Data Security Policy - Specify Data Security Policy Information**

Data Security Policy Name: north america

Select the access privileges for each user or role below

User or Role	Type	Select	Insert
SCOTT	User	<input checked="" type="checkbox"/>	<input type="checkbox"/>



# OLAP 11g Changes

- Calc Wizard replaced by powerful "complete the sentence" wizard
- Expression language more SQL-like
- EQs of Calculated Measures in 11g-format AWs "read-only"

Choose a calculation type:

Rank

Calculation:

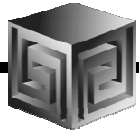
Rank members of the PRODUCT dimension and PRIMARY hierarchy based on measure UNITS\_CUBE.UNITS (...)

. Calculate rank using RANK method with member's level in order lowest to highest.

member's level  
member's parent  
member's ancestor

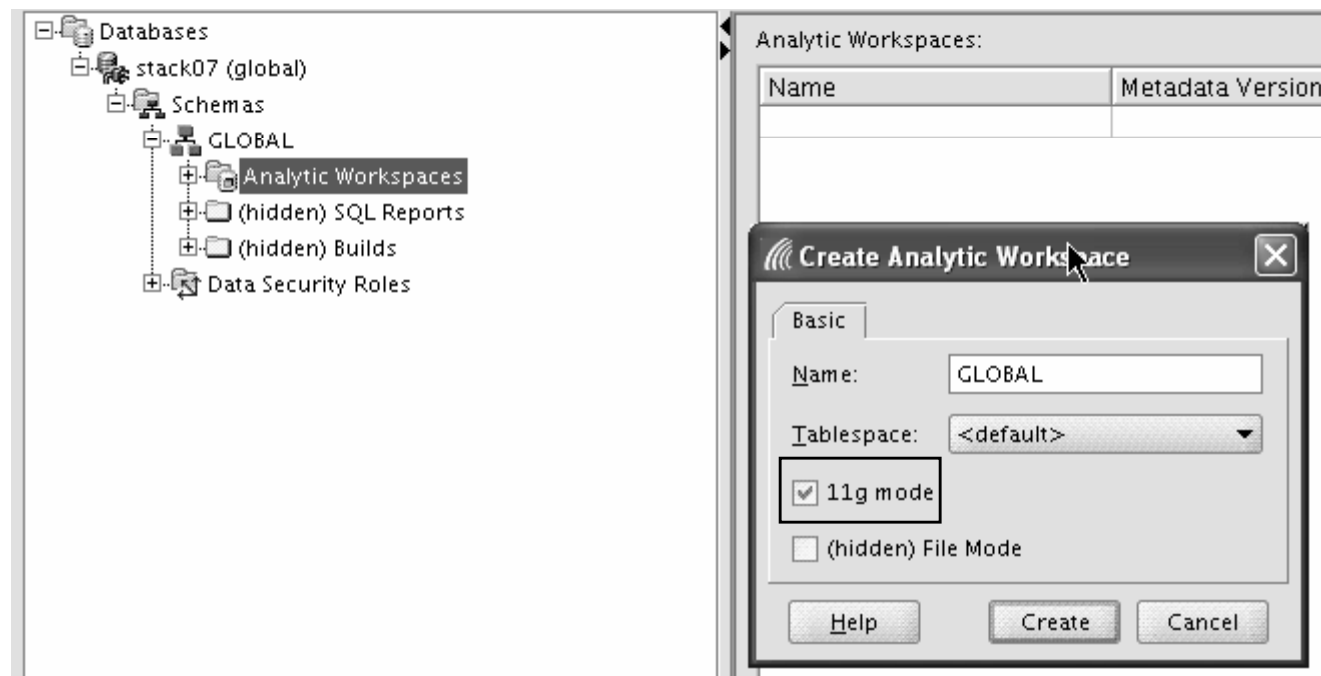
Expression:

RANK() OVER HIERARCHY (GLOBAL.PRODUCT.PRIMARY ORDER BY GLOBAL.UNITS\_CUBE.UNITS WITHIN LEVEL)

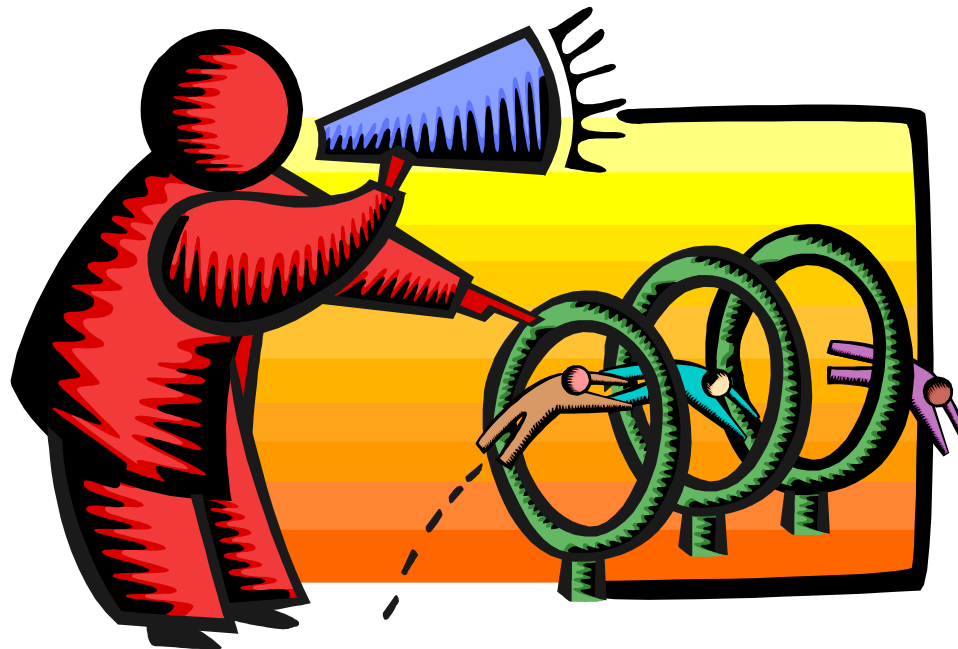


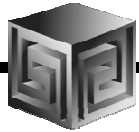
# OLAP 11g Changes

- Can Create AWs in 11g mode (automatic views)
- If no 11g mode, have same flexibility as 10g



# Building Cubes in AWM

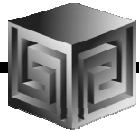




# **AWM Cube Builder Tips**

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- **Remember to save Everything to XML files**
- **Remember this is Realtime.... So changes are nearly immediate (may need to reload data)**
- **Use “View” to see results in tool – No Need for BI Beans to validate success!**
- **Move Measures to Folders**
- **Can save Calculated Measures to XML – Then you can Edit!**



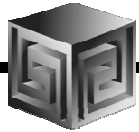
# Getting the Data Out

- Once the Data is in OLAP how do we get the data out?
- Alternatives
  - ☐ OBIEE
  - ☐ BI Beans applications (Custom or pre-built)
  - ☐ Discoverer
  - ☐ Oracle Reports
  - ☐ SQL Access from any SQL tool
  - ☐ Spreadsheet Add-in
  - ☐ Any except Spreadsheet add-in can be in a portal and with web interface

# What Access Tool?



- **Java OLAP API designed for products**
- **Discoverer for ad hoc analysis**
- **BI Beans for custom applications (using JDev)**
- **Spreadsheet Add-in for access from Excel**
- **Oracle Reports for highly formatted reports**
- **Oracle Apps for analysis of Apps data**
- **Oracle BIEE**
- **BI Publisher**
- **3rd Party tools fill in gaps**



# Changing Oracle BI Product Line

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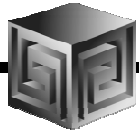
- **Frontends**

- ☐ Oracle BI EE (Siebel)
- ☐ Oracle BI SE (Discoverer, BI Beans)
- ☐ Oracle BI SE One (stripped down Siebel)

- **Backends**

- ☐ Oracle relational (and Disco Administrator)
- ☐ Oracle OLAP cubes
- ☐ Heterogeneous for BI EE (MS, SAP BW, etc.)





# Further Information

- Oracle BI Sales
  - ❑ <http://www.oracle.com/bi>
- Oracle BI Technical
  - ❑ <http://www.oracle.com/technology/tech/bi/index.html>
- Oracle BI EE on top of Oracle OLAP
  - ❑ Collaborate 208: Using Oracle BI EE with Oracle OLAP Cubes on [www.vlamis.com/presentations](http://www.vlamis.com/presentations)
- VMWare image with Demo environment
  - ❑ Send [dvlamis@vlamis.com](mailto:dvlamis@vlamis.com) an email
- Oracle OLAP and AWM Sales
  - ❑ [http://www.oracle.com/solutions/business\\_intelligence/olap.html](http://www.oracle.com/solutions/business_intelligence/olap.html)
- Oracle OLAP Technical
  - ❑ <http://www.oracle.com/technology/products/bi/olap/index.html>

# QUESTIONS?

