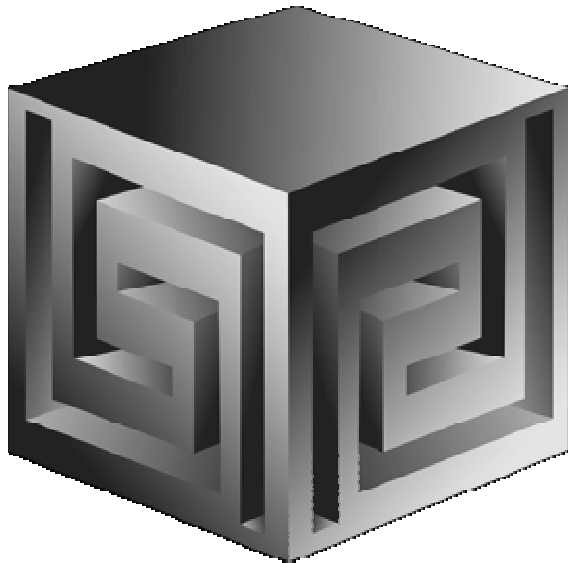


Building Cubes and Analyzing Data using Oracle OLAP 11g

Oracle OpenWorld 2008



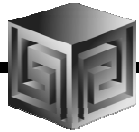
Dan Vlamis

dvlamis@vlamis.com

**Vlamis Software Solutions,
Inc.**

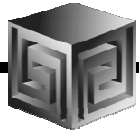
816-781-2880

<http://www.vlamis.com>



Vlami Software Solutions, Inc.

- **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**
 - ☐ **Multi-dimensional applications**
- **Delivers**
 - ☐ **Design and integrate BI and DW solutions**
 - ☐ **Training and mentoring**
- **Expert presenter at major Oracle conferences**



Vlami OpenWorld Presentations

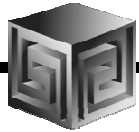
Presenter	Time	Title
Dan Vlami	Sun 8:30-10:00	Building Cubes and Analyzing Data using Oracle OLAP 11g
Mark Thompson	Sun 2:30-4:00	Integration of OBIEE and Essbase
Dan Vlami	Sun 4:00-5:30	BIWA Panel: Why Do BI Projects Fail?
Dan Vlami	Mon 1:00-2:00	Faster and Smarter Data Warehouses with Oracle Database 11g

Dan Vlamis, President, Vlamis Software Solutions



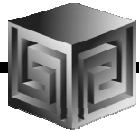
- **Developer for IRI (former owners of Oracle OLAP)**
- **Founded Vlamis Software in 1992**
- **Wrote portions of Oracle Sales Analyzer**
- **Beta tester and early adopter of Oracle OLAP**
- **Expert speaker and author**
- **Recognized expert in Express and OLAP industry**
- **Bringing multi-dim experience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

dvlamis@vlamis.com 816-781-2880



Agenda

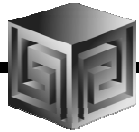
- **Why Oracle OLAP?**
- **What is Oracle OLAP and Cubes?**
- **Building OLAP Cubes**
- **11g OLAP – what changed?**
- **Demo of building cubes**
- **BIWA Information**



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!



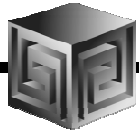
Why use OLAP?

- **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?

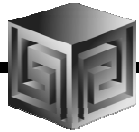


- **Better performance!**
- **Multidimensional user view of data**
- **Users create own reports**
- **Users create own measures**
- **Easy drill-down, rotate**
- **Iterative discovery process (not just reports)**
- **Ad-hoc analysis**
- **Easy selection of data with business terms**
- **OLAP DML with what-if, forecasting**
- **Platform for extensions**



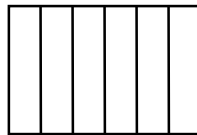
OLAP Option – High-level View

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

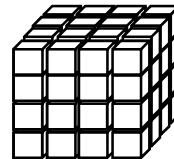


ROLAP vs. MOLAP

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

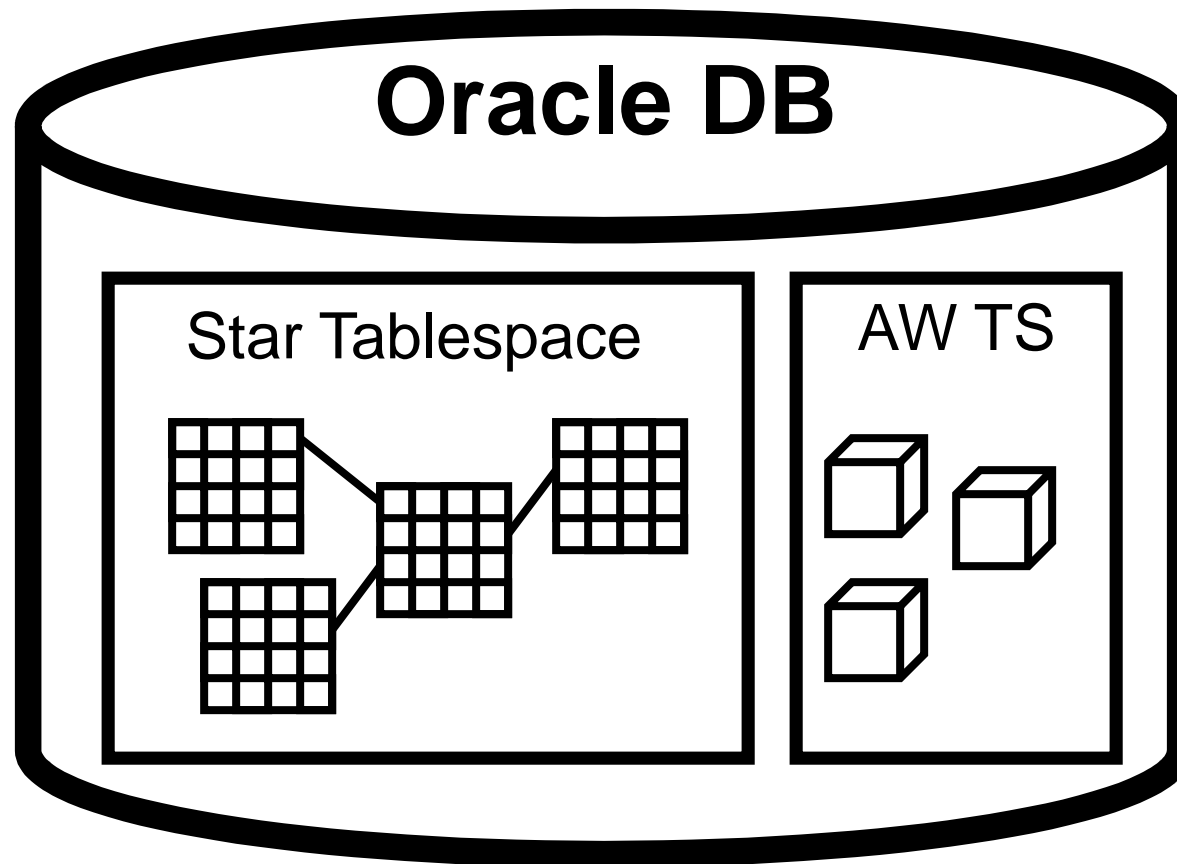


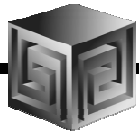
Relational



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:

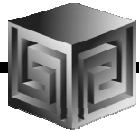
Name	Long Description	Type
CHANNEL	Channel	User
CUSTOMER	Customer	User
PRODUCT	Product	User
TIME	Time	Time

Cubes:

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

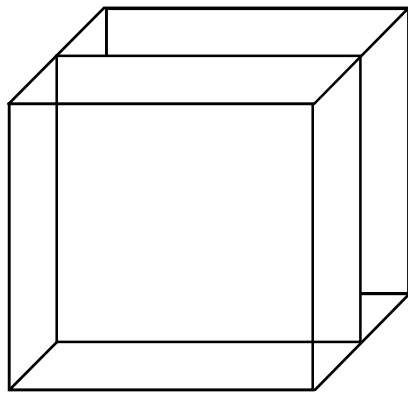
Measures:

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

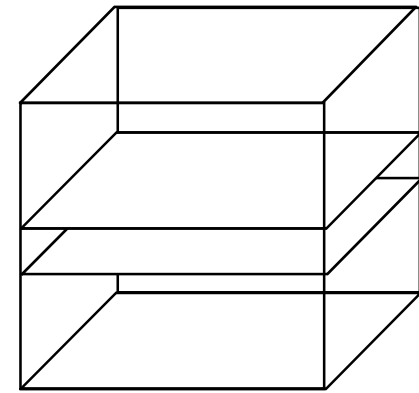
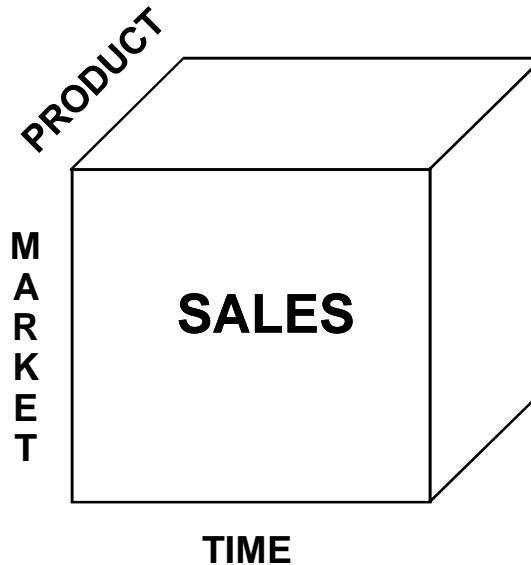


OLAP AW Stores Data in Cubes

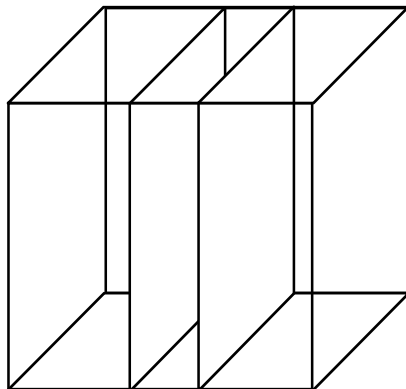
Fast Flexible Access to Summarized Data



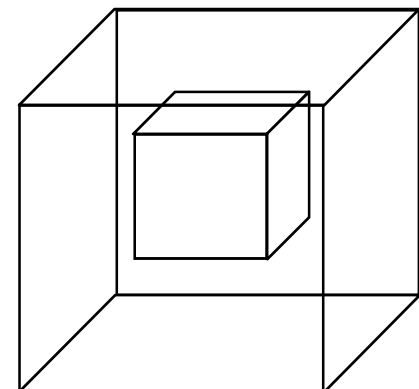
Product Mgr. View



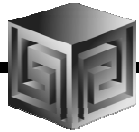
Regional Mgr. View



Financial Mgr. View

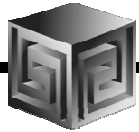


Ad Hoc View



What Are AW Cubes?

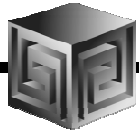
- **Data stored as arrays**
- **Dimension values are internally integers**
- **Offset calculated using simple multiplication**
- **Offset tells exactly where to look for data**
- **Pages and segmentation complicate design**
- **Conjoints and composites handle sparsity**



Dimensions

Definition:

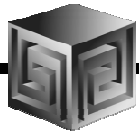
- **Dimensions are collections of keys or lookup values that allow for querying and subsetting data.**
- **Dimensions can be flat, parent-child or hierarchical in nature**
- **Examples:**
 - ☐ **Time (year,quarter, month, day)**
 - ☐ **Geograpy (continent,region,country,state)**
 - ☐ **Product(all products,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



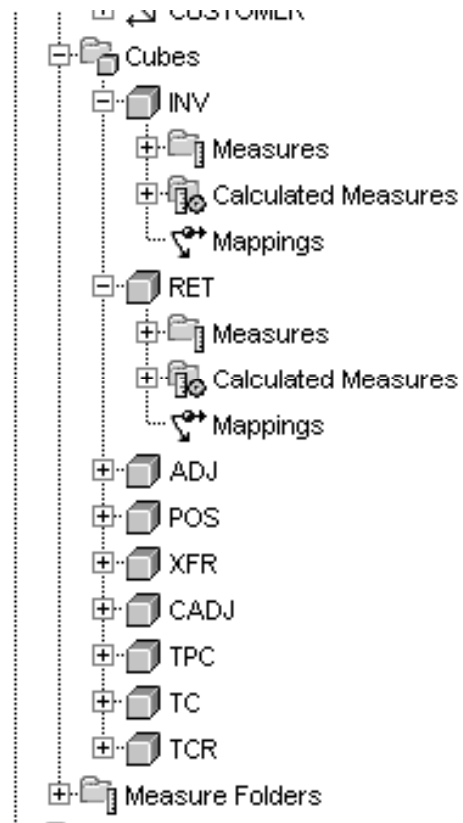
Cubes Defined

Definition:

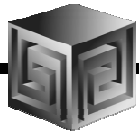
- **Cubes are collections of measures. They are a logical way to organize data. All measures in a cube share the same dimensionality**
- **Examples:**
 - ☐ **Sales_Cube (with Units, Dollars, Profit)**
 - ☐ **Finance_Cube (with Actual, Budget, Variance)**



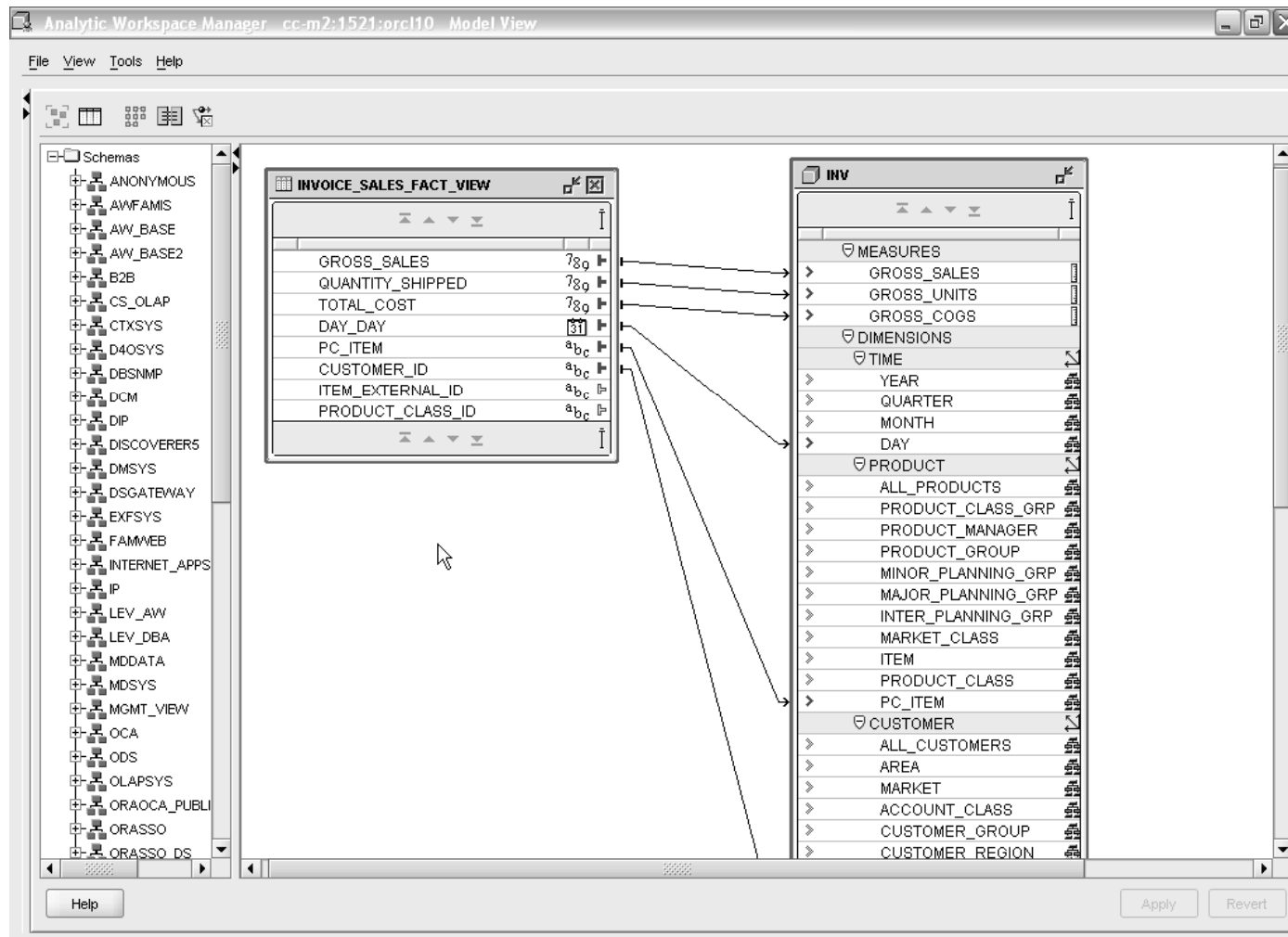
Cubes in AWM







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

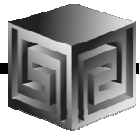
Date and Time: 03/28/2005 19:30:35

Maximum number of parallel processes: 1

☐ Save maintenance task to script

File Name:

Help < Back Next Finish Cancel



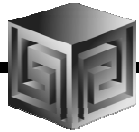
Maintaining Dims/Cubes

Build Log

X

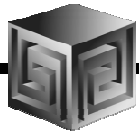
XML_MESSAGE	XML_AW	XML_DATE
19:18:32 Started Build(Refresh) of LEV_AW.LEV_AW Analytic Workspa...	LEV_AW.LE...	2005-03-28...
19:18:32 Attached AW LEV_AW.LEV_AW in RW Mode.	LEV_AW.LE...	2005-03-28...
19:18:32 Started Loading Dimensions.	LEV_AW.LE...	2005-03-28...
19:18:32 Started Loading Dimension Members.	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...

Close



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

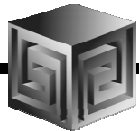
- **New CUBE_TABLE function simplifies access to AW data (replacing OLAP_TABLE)**

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' tree is expanded to 'stack07 - global - main3' > 'Views' > 'CUSTOMER_SHIPMENTS_VIEW'. The main window displays the 'Enter SQL Statement' editor with the following query:

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

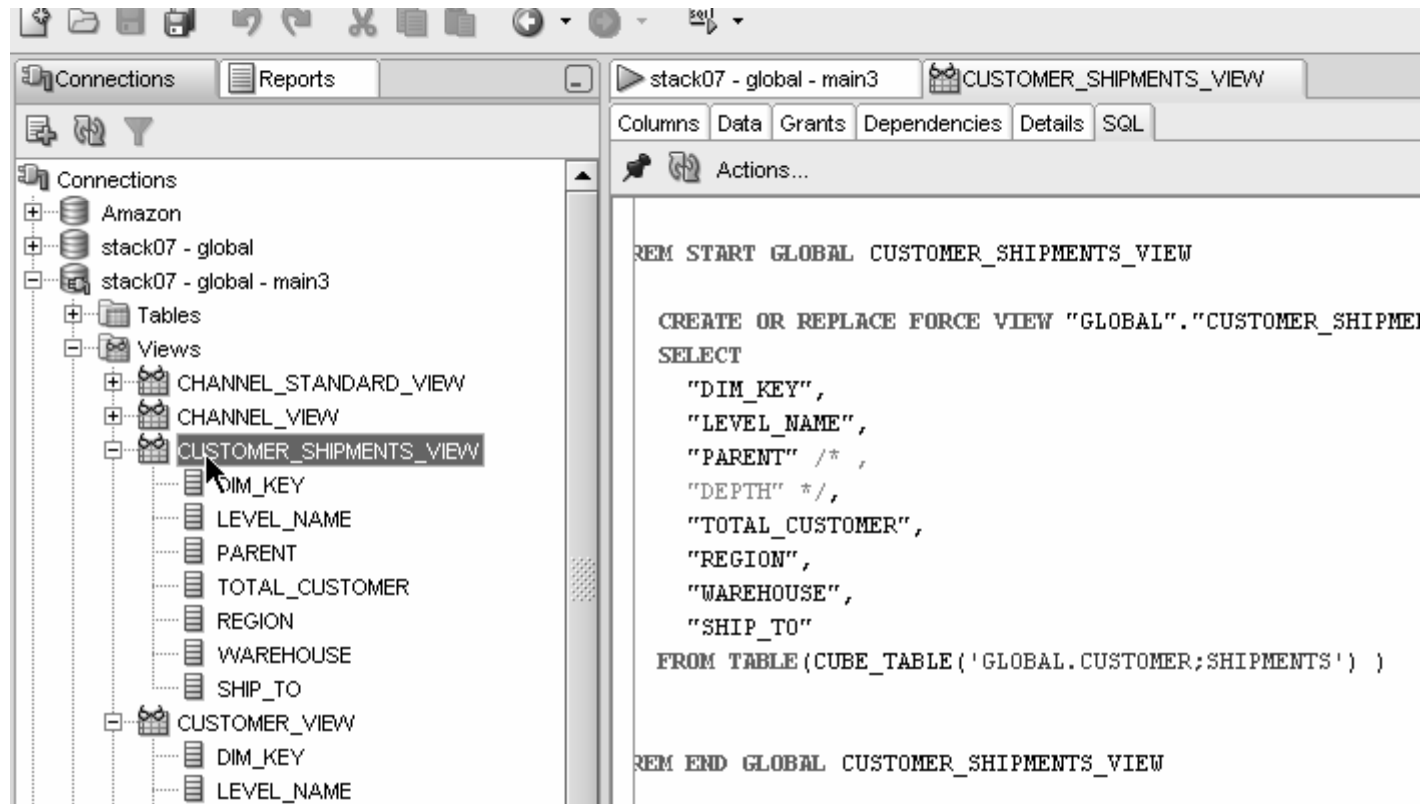
Below the editor, the 'Results' tab is active, showing a table with 6 columns: REGION, WAREHOUSE, SHIP_TO, LEVEL_NAME, and LONG_DESCRIPTOR. The results are as follows:

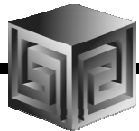
	REGION	WAREHOUSE	SHIP_TO	LEVEL_NAME	LONG_DESCRIPTOR
1	(null)	(null)	REGION	Europe	
2	(null)	(null)	REGION	North America	
3	(null)	(null)	REGION	Asia Pacific	
4	20	99	SHIP_TO	UK Env Dept Glasgow	



OLAP 11g Changes

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



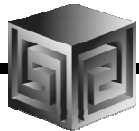


OLAP 11g Changes

- 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

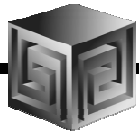
abases
stack07 (global)
Schemas
GLOBAL
Analytic Workspaces
GLOBAL (attached RW)
Dimensions
CUSTOMER
PRODUCT
TIME
CHANNEL
Levels
TOTAL_CHANNEL
CHANNEL
Hierarchies
STANDARD
Attributes
Unique Key Attributes
Mappings
Views
CHANNEL_VIEW - [Dimension ET]
VIEWNAME - [Hierarchy: STANDARD]
Data Security

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

Databases

- local 11g
- oracle11g (global) - OLAP 11g
- Schemas
 - GLOBAL
 - Analytic Workspace
 - GLOBAL (attached)
 - Dimensions
 - Cubes
 - PRICE_CUBE
 - UNITS_CUBE
 - Measure Functions
- Reports
- vss6

General Aggregation Partitioning Storage **Materialized Views**

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

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 Query Rewrite

Materialized View Implementation Details

Compatibility Check list Materialized View details

Status	Required for	Object	Check
<input checked="" type="checkbox"/>	Rewrite	UNITS_CUBE	User must have create Materialized View privilege
<input checked="" type="checkbox"/>	Rewrite	UNITS_CUBE	Cube must be compressed
<input checked="" type="checkbox"/>	Rewrite	UNITS_CUBE	Cube must have one or more Measures



OLAP 11g Changes

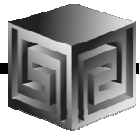
- Optimizer pushes joins down to AW
- Enables efficient non-OLAP-aware SQL queries

```
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'
```

DB Object Search

Results | Script Output | **Explain** | Autotrace | DBMS Output | OWA Output

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	

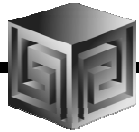


OLAP 11g Changes

- Views are stored in Oracle Dictionary
- Notice in SYS.USER_DIMENSION_VIEWS

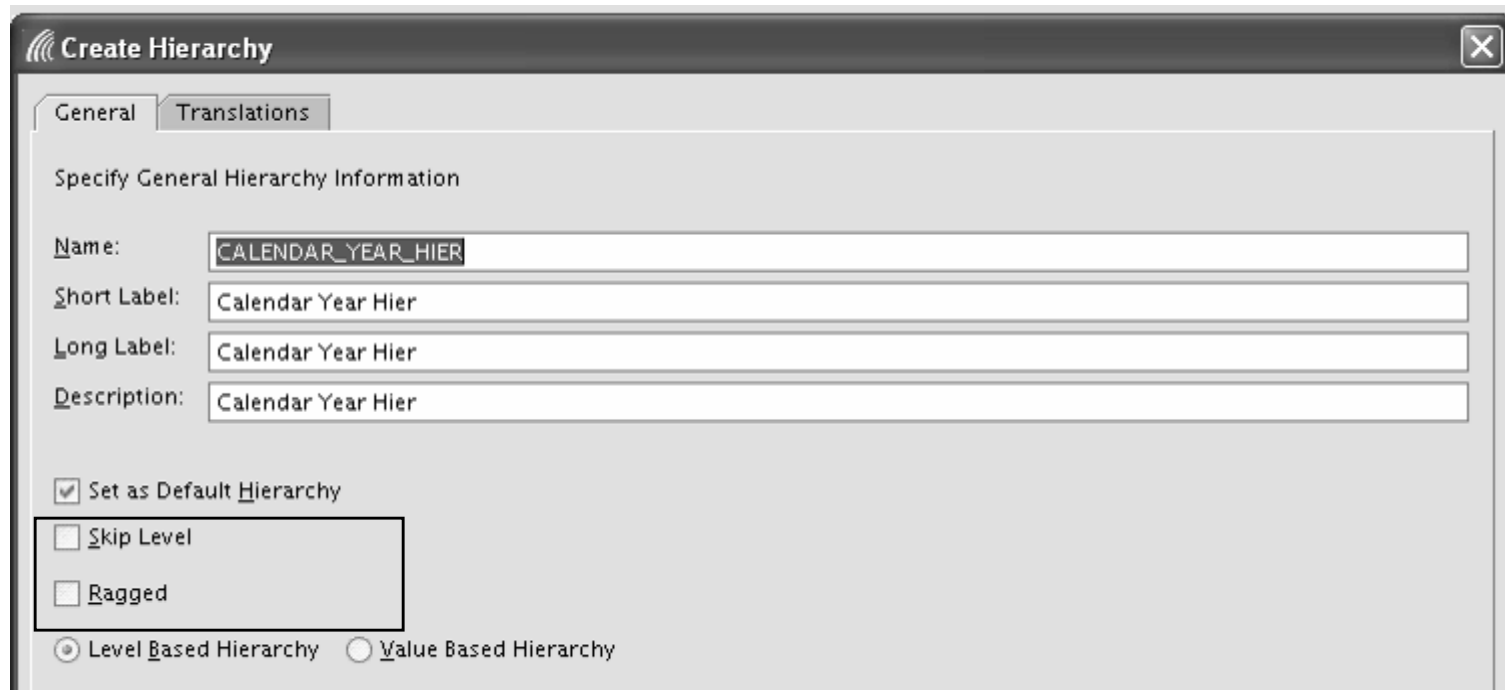
The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' tree is expanded to 'stack07 - global - main3' > 'Views', where 'CUSTOMER_SHIPMENTS_VIEW' is selected. The main window shows the 'Enter SQL Statement' area with the query: `select * from sys.user_dimension_views;`. Below the query, the 'Results' tab is active, displaying a table with 4 rows and 4 columns: DIMENSION_NAME, VIEW_OWNER, VIEW_NAME, and VIEW_TYPE.

	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

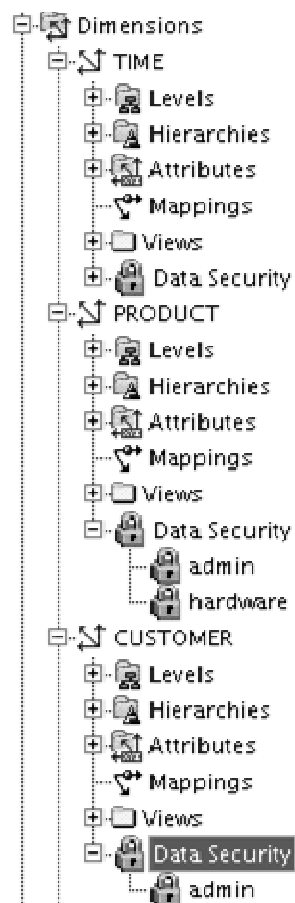
☐ Ragged

☒ Level Based Hierarchy ☐ Value Based Hierarchy



OLAP 11g Changes

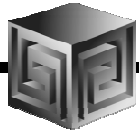
- Create security policies based on hierarchies



The 'Create Data Security Policy' dialog box is shown with the 'Member Selection' tab selected. It displays the 'Available' hierarchy (Hierarchy > Descendants of Hardware > TOTAL_CUSTOMER) and the 'Selected' members (1. Start with Hardware, 2. Add Descendants of Hardware). The 'Condition Expression' field contains the expression: `GLOBAL.PRODUCT.DIM_KEY IN ('2') OR '2 GLOBAL.PRODUCT.PRIMARY LEVEL GLOBAL`.

Below the dialog box, the 'Specify Data Security Policy Information' section is shown with the 'Data Security Policy Name' set to 'north america'. The 'Select the access privileges for each user or role below' section contains a table with the following data:

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:

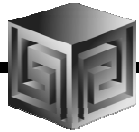
Rank members of the PRODUCT dimension and PRIMARY hierarchy based on measure UNITS_CUBE.UNITS (...)

. 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)



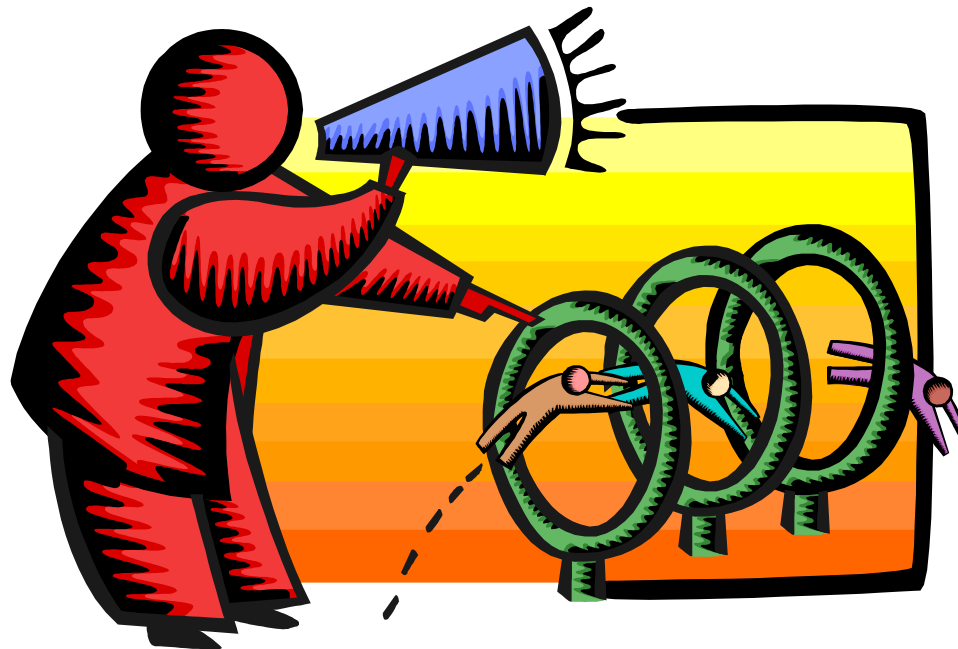
OLAP 11g Changes

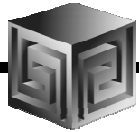
- Can Create AWs in 11g mode (automatic views)
- If no 11g mode, have same flexibility as 10g





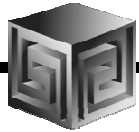
Building Cubes in AWM





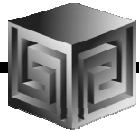
AWM Cube Builder Tips

- **Remember to save Everything to XML files**
- **Remember this is Real-time.... 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 use custom expressions for custom measures**
- **Can save Calculated Measures to XML**



Getting the Data Out

- Once the Data is in OLAP how do we get the data out?
- Alternatives
 - ☐ OBIEE
 - ☐ BI Beans applications (not yet for 11g)
 - ☐ Discoverer (not yet for 11g)
 - ☐ BI Publisher
 - ☐ Spreadsheet Add-in (not yet for 11g)
 - ☐ SQL Access from any SQL tool (e.g. APEX)



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
- VMWare image with Demo environment
 - ❑ Send dvlamis@vlamis.com an email
- Oracle OLAP and AWM Sales
 - ❑ http://www.oracle.com/solutions/business_intelligence/olap.html
- Oracle OLAP Technical
 - ❑ <http://www.oracle.com/technology/products/bi/olap/index.html>



http://OracleBIWA.org

nobody [Login](#)

General Information

[Home](#) [Upcoming Events](#) [Partners](#) [Promotions](#)

Membership Benefits

Existing Members Login

Benefits of joining BIWA SIG -
Get the latest information
about Business Intelligence
trends

Join the related blogs to
Express Yourself!

Network with the best of the
Industry professionals and with
other Oracle User Groups

Network with other like-minded
local Oracle users

Share code and technology
hints and tips with fellow
members

Learn from the exciting guest
speakers at every meeting

Express your views and ask
questions about Oracle
technology

Become a Member

*Welcome to the Business Intelligence, Warehousing and Analytics
Special Interest Group (BIWA SIG) Website!*

**Add the BIWA Summit , Dec 2-3, 2008, at Oracle's World HQ, to your calendar!
For BIWA Summit '08 details, click on the Summit tab above.**

Oracle BIWA Summit 2008 is a forum for business intelligence, warehousing and analytics professionals to
exchange information, experiences and best practices.
Gain the knowledge and information critical for success in your work.

All This at One 2-Day Event at Oracle Headquarters! Click on the Summit 2008 tab above for details.

<ul style="list-style-type: none"> • Keynote Addresses Jeanne Harris - coauthor of bestselling book <i>Competing on Analytics</i> Director of Research Accenture Institute for High Performance Business Juan Loaiza - Vice President of Systems Technology Group, Oracle Inc. Ray Roccaforte - Vice President of Data Warehousing and Business Intelligence Platform, Oracle Inc. Usama Fayyad - Chief Data Officer, Yahoo! Inc. 	<ul style="list-style-type: none"> • Hands-On Workshops
<ul style="list-style-type: none"> • 3 Tracks of Technical Talks with More than 75 sessions running in 6+ parallel rooms 	<ul style="list-style-type: none"> • Solution Showcase
<ul style="list-style-type: none"> • Meet the Oracle Experts 	<ul style="list-style-type: none"> • Solution Providers Sessions
<ul style="list-style-type: none"> • Analyst/User Panel Discussions 	<ul style="list-style-type: none"> • ...And Much More!

Reminder Oracle BIWA Summit 2008

- **Business Intelligence, Warehousing, Analytics**
- **Oracle BIWA Summit 2008**
- **Oracle HQ, Redwood Shores on Dec 2-3, 2008**
- **Four keynotes, 50+ sessions, vendor displays**
- **Hands-on labs**
- **Early Bird \$250 (\$200 for IOUG members), Sep 30**
- **Detail are at:**

<http://BIWASummit08.org>


- **Email:**

Conference@OracleBIWA.org



BIWA Speaker Survey – Open World

- Please complete the BIWA SIG speaker evaluations for Sep 21 at:
- <http://OracleBIWA.org>,
- After logging in, “Resources for Members” tab



BIWA SIG
Better Information Better Results
www.oraclebiwa.org

SNATH Admin Logout

Home Reviews News Downloads RSS Feeds Events My User Profile **Survey** Newsletters

General Information

INTRODUCTION

Please choose a survey ▼

Please choose a survey

BIWA Summit 2008 Attendee Survey

BIWA Oracle OpenWorld Speaker Survey 08

Local Newsletters

Right-click on a filename to download.



QUESTIONS?

