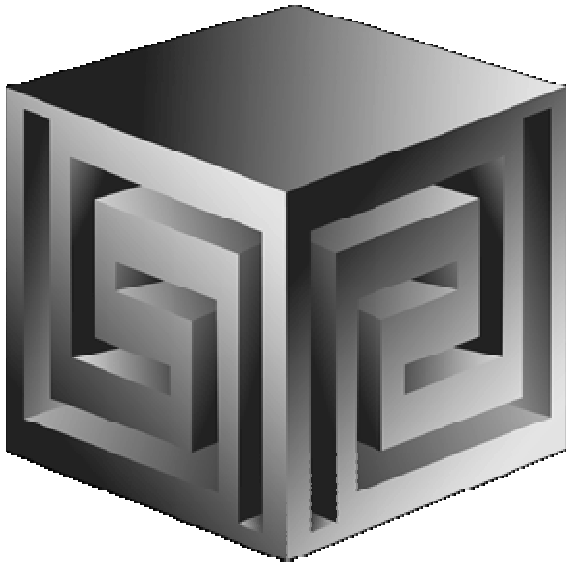
Implementing Oracle BI EE on Top of Oracle OLAP Cubes

Collaborate 08 Paper 221
April 16, 2008



Dan Vlamis

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Vlamis 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
  - Express-based applications
- Delivers
  - Design and integrate BI and DW solutions
  - Training and mentoring
- Expert presenter at major Oracle conferences

Who Am I?

- **Dan Vlamis, President of Vlamis Software**
  - **Developer for IRI (former owners of Express)**
  - **Founded Vlamis Software in 1992**
  - **Beta tester and early adopter of Oracle OLAP**
  - **Expert speaker and author**
  - **“Techie” on OLAP DML**
  - **Recognized expert in Express and OLAP industry**

Vlamis Collaborate Presentations

Presenter	Num	Time	Title
Chris Claterbos	U10	Sun, 9-5	How to Use Oracle Business Intelligence (BI) to Solve Real World Problems
Dan Vlamis	207	Mon, 1-2	Oracle BI, Oracle OLAP, Essbase: The Benefits and Cost of Openness
Dan Vlamis	211	Mon, 3:30-4:30	Accelerate Your Oracle DW With OLAP 11*g*
Genco, Mark Thompson	212	Tues, 9:45-12	Integrating Oracle BIEE with Oracle Analytic Workspaces
Chris Claterbos	219	Tues, 3:30-5:45	Building Cubes and Analyzing Data Using Oracle OLAP 11*g*
Dan Vlamis	221	Wed, 8:30-9:30	Implementing Oracle BI EE on Top of Oracle OLAP Cubes
Mesirow, Chris Claterbos	223	Wed, 9:45-10:45	Achieving Complex Statistical Modeling with Fast Results Using Oracle OLAP

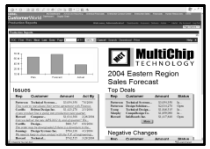
Agenda

- Brief background of BI EE and Oracle OLAP
- Demonstration of BI EE on Oracle OLAP
- Why Oracle OLAP?
- What is Oracle OLAP?
- Oracle OLAP storage options
- Structure of Analytic Workspace
- Building OLAP Cubes
- 11g OLAP – what changes?

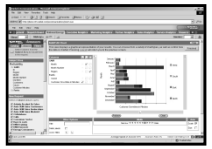
Oracle BI Suite Enterprise Edition
Unified Business Intelligence Infrastructure

Interactive Dashboards

Reporting & Publishing



Ad-hoc Analysis



Proactive Detection and Alerts

Disconnected Analytics

MS Office Plug-in

Microsoft Office

Oracle BI Server

- Simplified Business Model and Abstraction Layer
- Intelligent Caching Services
- Multidimensional Calculation and Integration Engine
- Intelligent Request Generation and Optimized Data Access Services

OLTP & ODS Systems

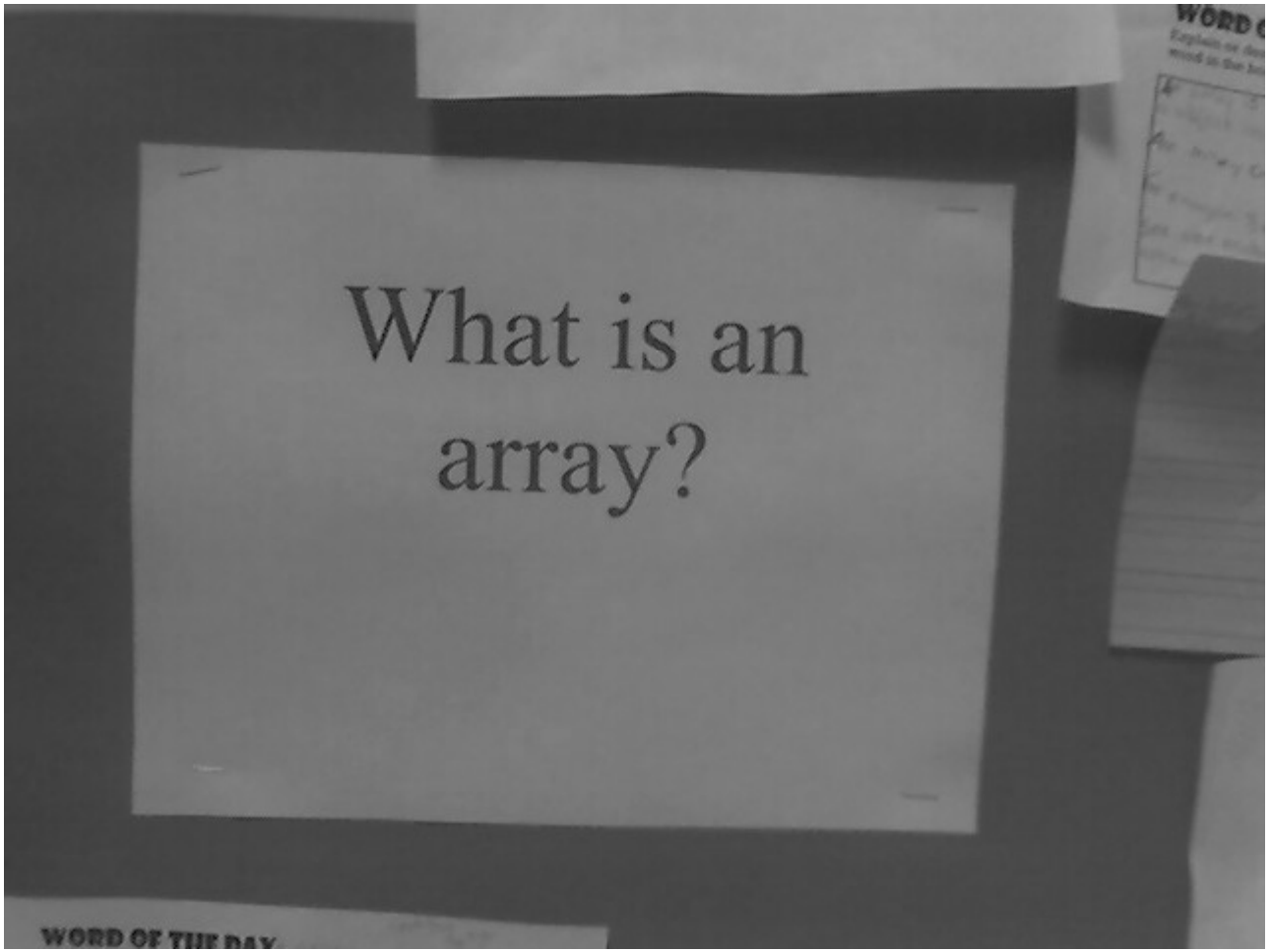
Data Warehouse Data Mart

SAP, Oracle PeopleSoft, Siebel, Custom Apps

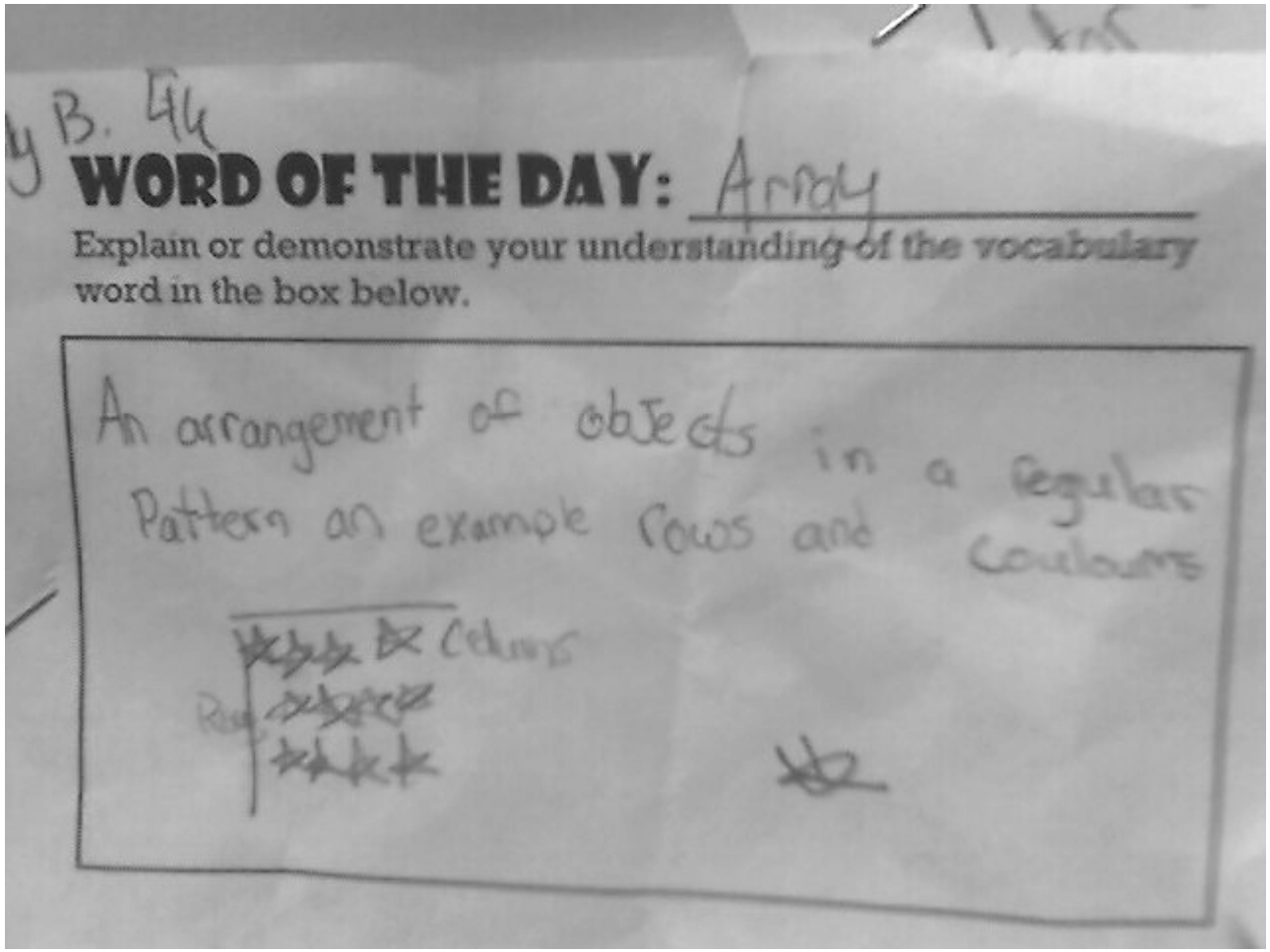
Files Excel XML

Business Process

Are You Smarter Than a 5th Grader?

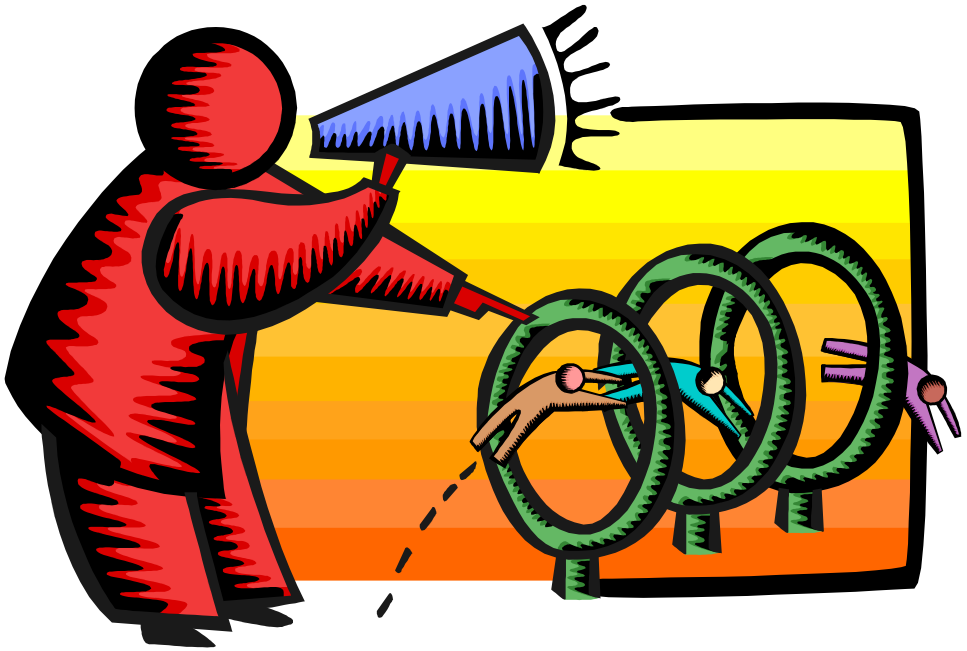


Arrays as Defined by a 5th Grader



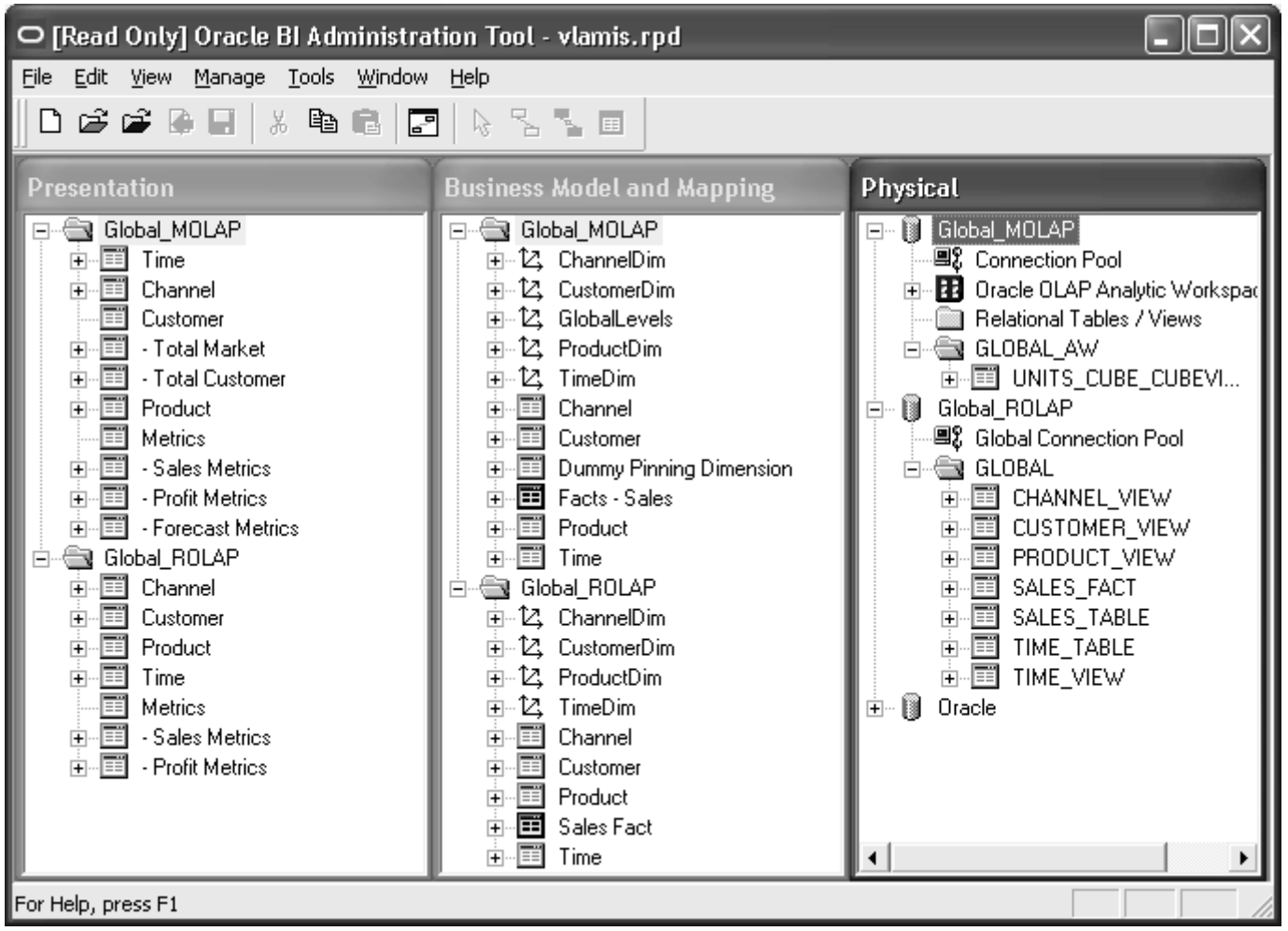
Courtesy Alexander Doniphan Elementary School, Liberty, Missouri

Demo of BI EE on Oracle OLAP



BI EE Metadata Editor

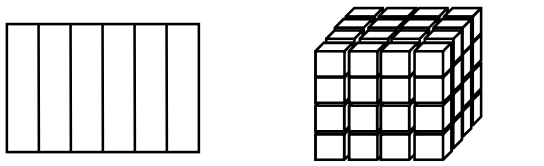
⇐ ⇐ **Data Flows**



ROLAP vs. MOLAP

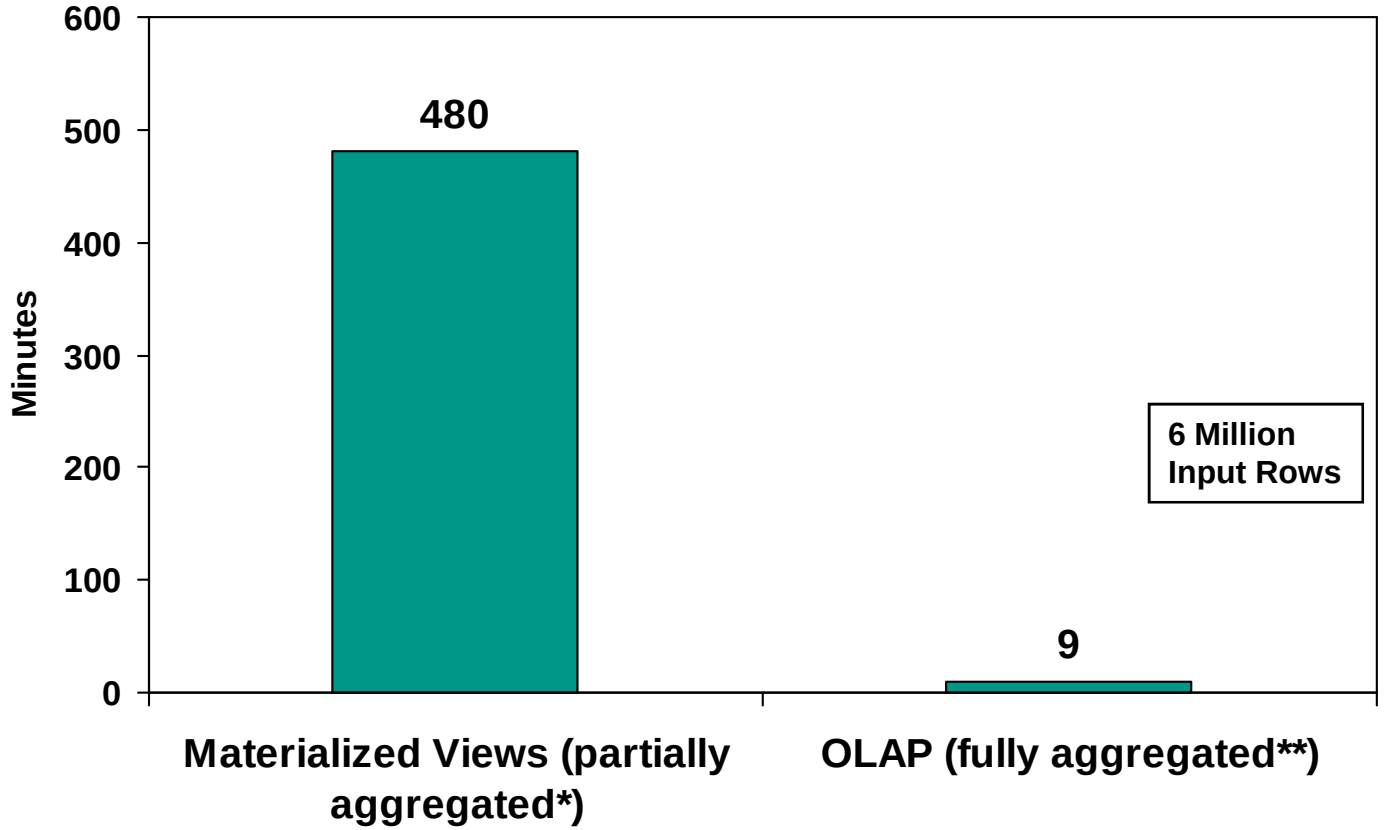
- **What is ROLAP? (Relational)**
- **What is MOLAP? (Multidimensional)**

- **It's all in how the data is stored**



Oracle Performance Case Study

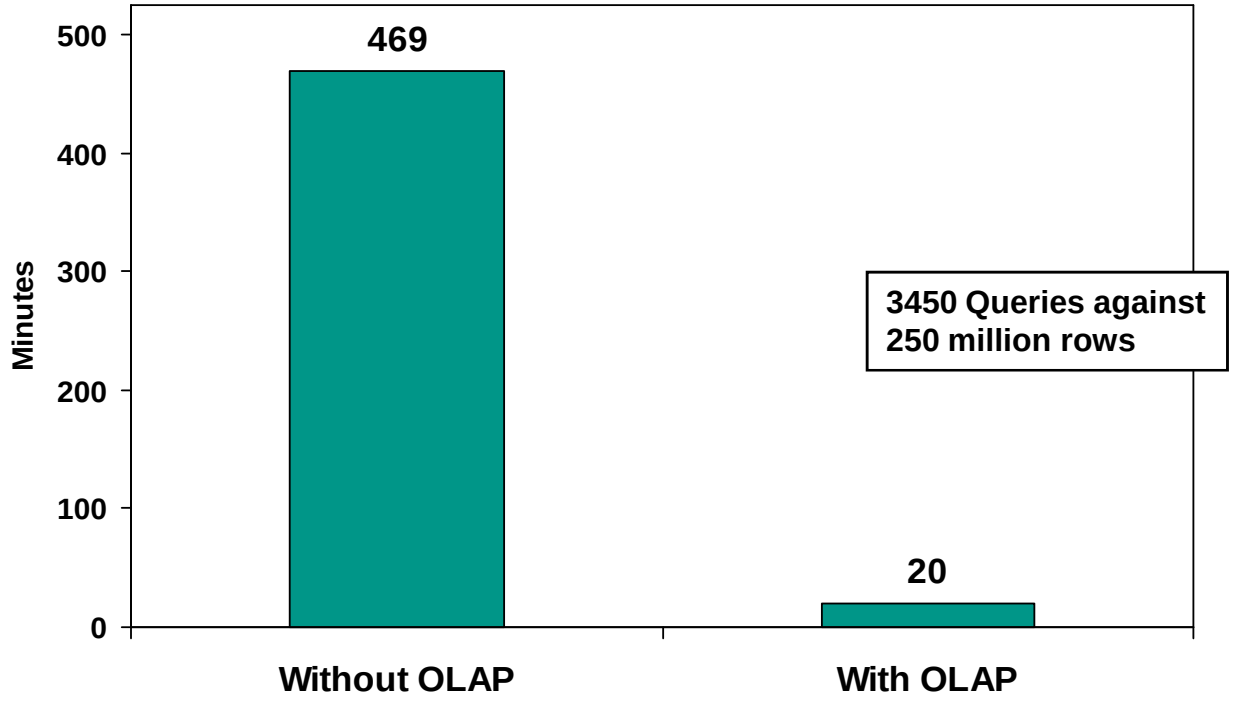
Oracle Applications: Finance DBI



* MV aggregated 1 dimension and 1 measure

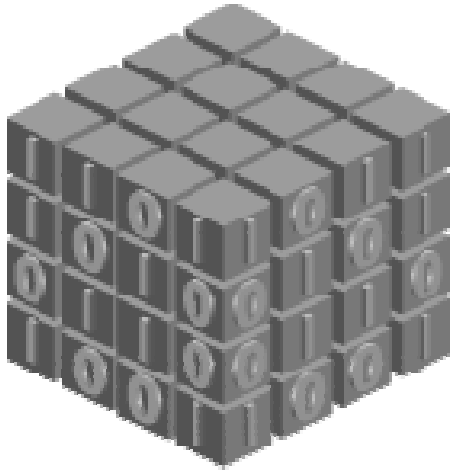
** OLAP aggregated 7 dimensions and 11 measures

Oracle Performance Case Study
Ad Hoc Queries Across Summary Levels

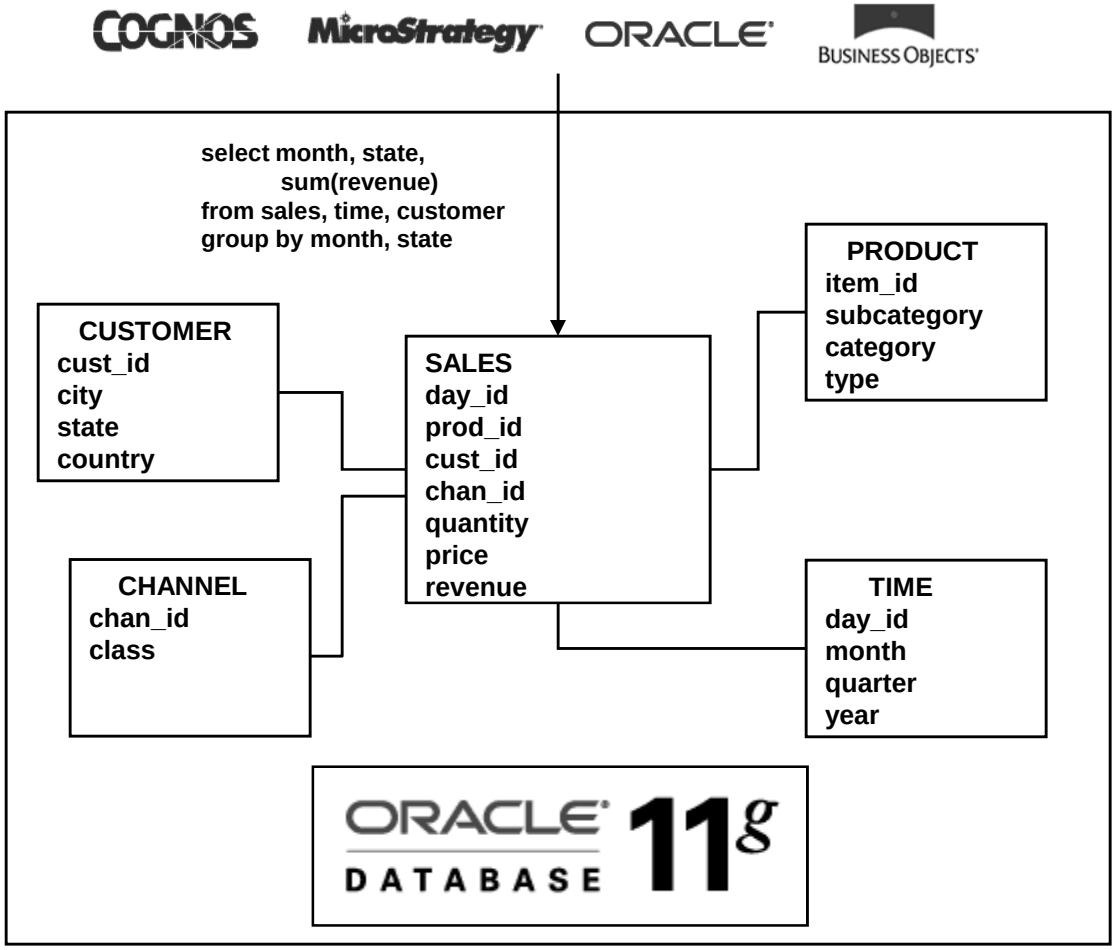


OLAP 11g Option

- A summary management solution for SQL based business intelligence applications
  - An alternative to table-based materialized views, offering improved query performance and fast, incremental update
- A full featured multidimensional OLAP server
  - Excellent query performance for ad-hoc / unpredictable query
  - Enhances the analytic content of Business intelligence application
  - Fast, incremental updates of data sets



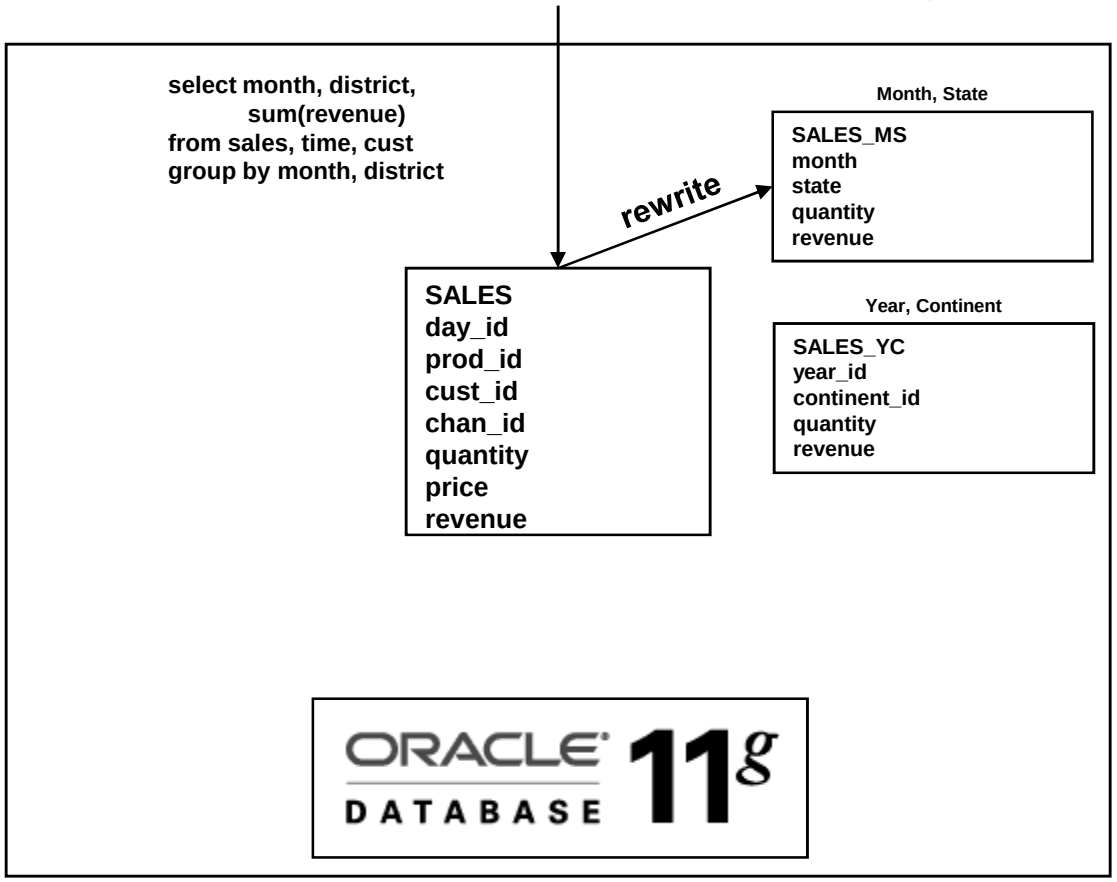
Materialized Views
Typical MV Architecture Today



- Query tools access star schema stored in Oracle data warehouse
- Most queries at a summary level
- Summary queries against star schemas can be expensive to process

Materialized Views
Automatic Query Rewrite

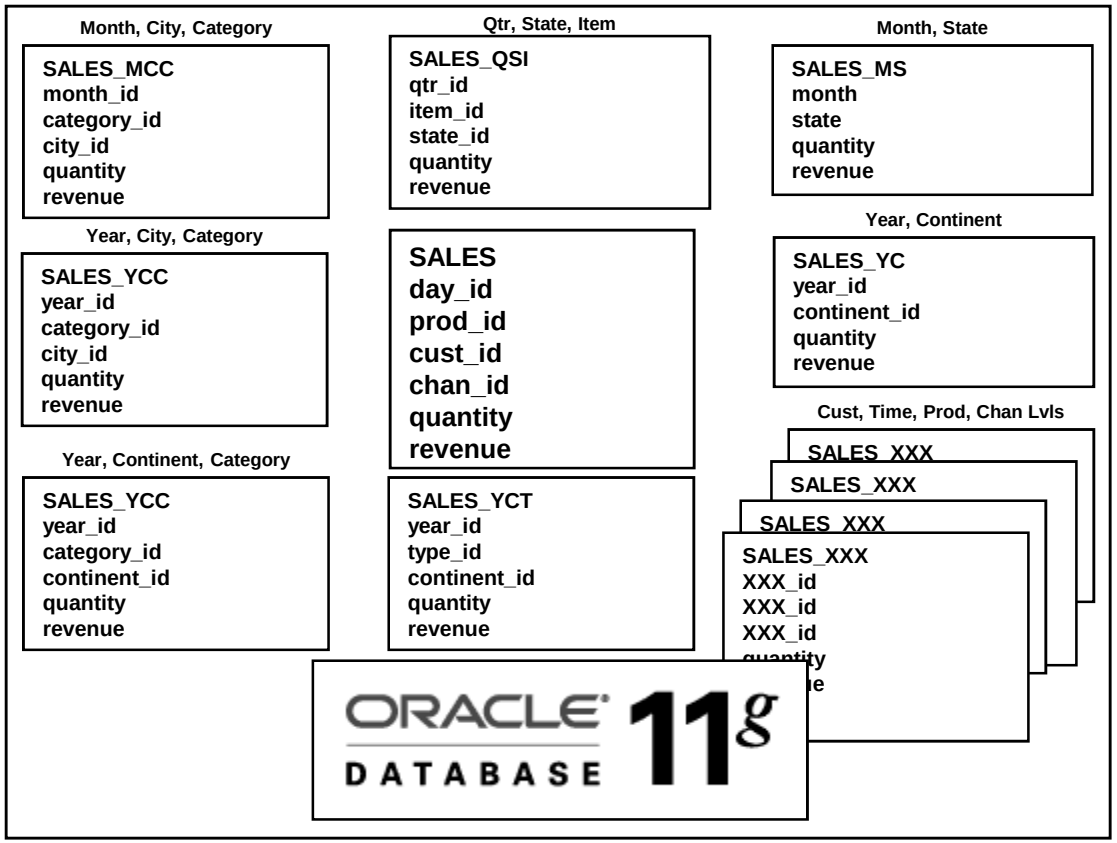
COGNOS MicroStrategy ORACLE BUSINESS OBJECTS



- Most DW/BI customers use Materialized Views (MV) today to improve summary query performance
- Define appropriate summaries based on query patterns
- Each summary is typically defined at a particular grain
  - Month, State
  - Qtr, State, Item
  - Month, Continent, Class
  - etc.
- The SQL Optimizer automatically rewrites queries to access MV's whenever possible

Materialized Views
Challenges in Ad Hoc Query Environments

COGNOS MicroStrategy ORACLE BUSINESS OBJECTS



- Creating MVs to support ad hoc query patterns is challenging
- Users expect excellent query response time across any summary
- Potentially many MVs to manage
- Practical limitations on size and manageability constrain the number of materialized views

Easy Analytics
Fast Access to Information Rich Results

- Time-series calculations
- Calculated Members
- Financial Models
- Forecasting
  - Basic
  - Expert system
- Allocations
- Regressions
- Custom functions
- …and many more

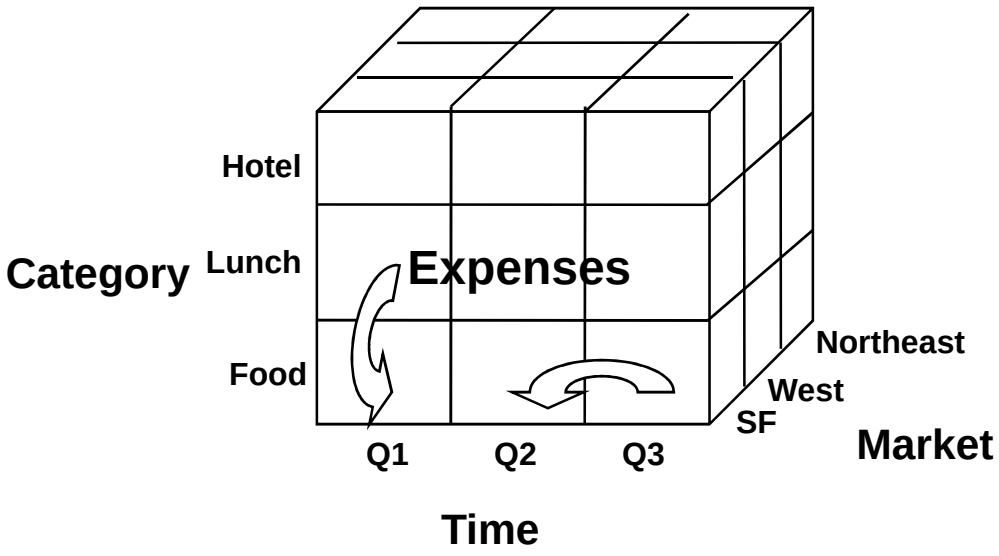
Snapshot of some functions

deprdecl	aggregate	abs	rank	chgdims
deprdeclsw	allocate	antilog	rem	instat
deprsl	categorize	antilog10	remainder	limit function
deprsoyd	correlation	arccos	round	statall
fintsched	fcopen	arcsin	sign	statdepth
fpmtsched	fcquery	arctan	sin	statequal
growrate	info	arctan2	sinh	statfirst
irr	normal	bin_to_num	smooth	statlast
npv	random	bitand	sort	statlen
vintsched	stddev	ceil	sqrt	statlist
vpmtsched	any	cos	tan	statmax
cumsum	average	cosh	tanh	statmin
lag	count	decode	truncate	statrank
lagabspct	every	exp	width_bucket	statval
lagdif	largest	floor	begindate	coalesce
lagpct	median	greatest	dayof	na2
lead	mode	intpart	ddof	nafill
movingaverage	none	least	enddate	naflag
movingmax	percentage	log function	endof	nullif
movingmin	smallest	log10	isdate	nvl
movingtotal	forecast	max	makedate	nvl2
total	modulo	min	mmof	ascii

Easy Analytics
Optimized Data Access Method

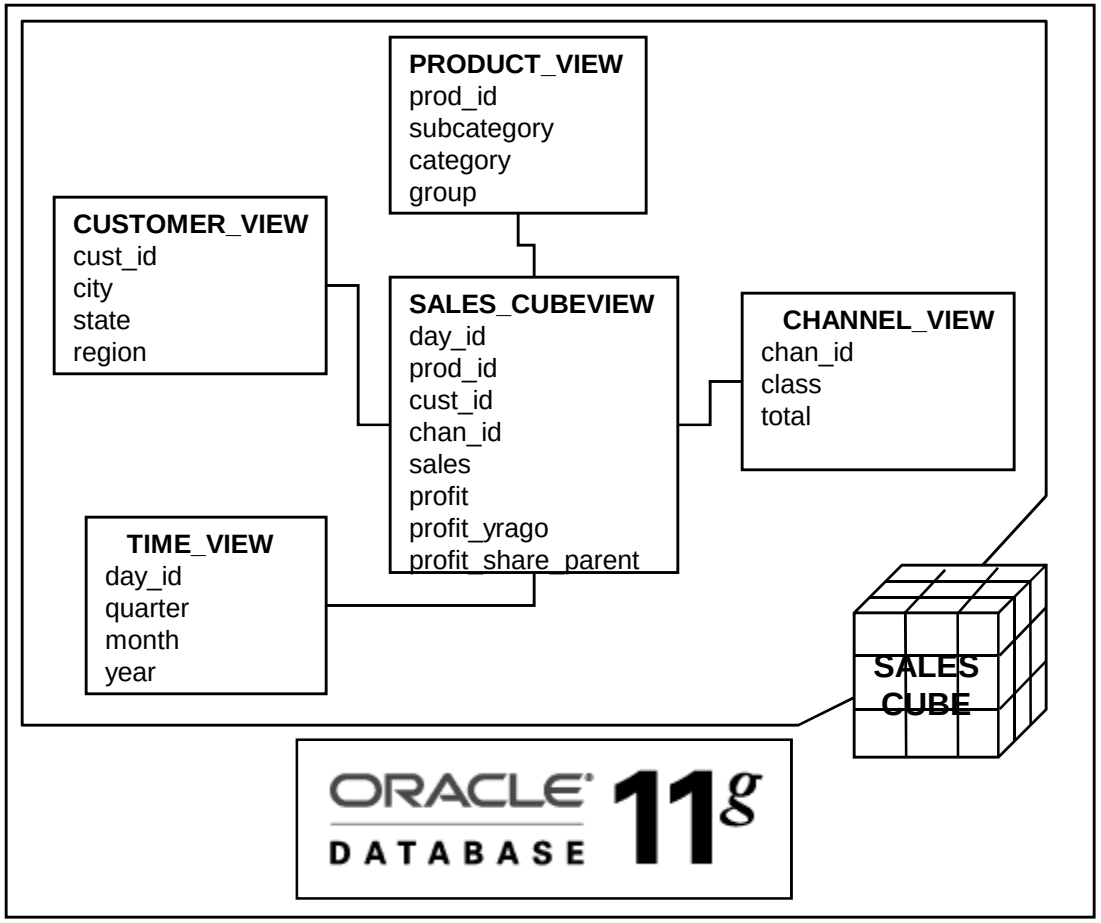
How do Expenses compare this Quarter versus Last Quarter

What is an Item's Expense contribution to its Category?



- Data stored in dense arrays
- Offset addressing – no joins
- More powerful analysis
- Better performance

Cube Represented as Star Model
Simplifies Access to Analytic Calculations



- Cube represented as a star schema
- Single cube view presents data as completely calculated
  - Analytic calculations presented as columns
  - Includes all summaries
- Automatically managed by OLAP

Further Information

- **Oracle BI Sales**
  - **http://www.oracle.com/bi**
- **Oracle BI Technical**
  - **http://www.oracle.com/technology/tech/bi/index.html**
- **VMWare image with Demo environment**
  - **www.bic2g.com**
- **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**
- **This Demo**
  - **http://www.vlamis.com/demo**

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

Top 11g New OLAP Features

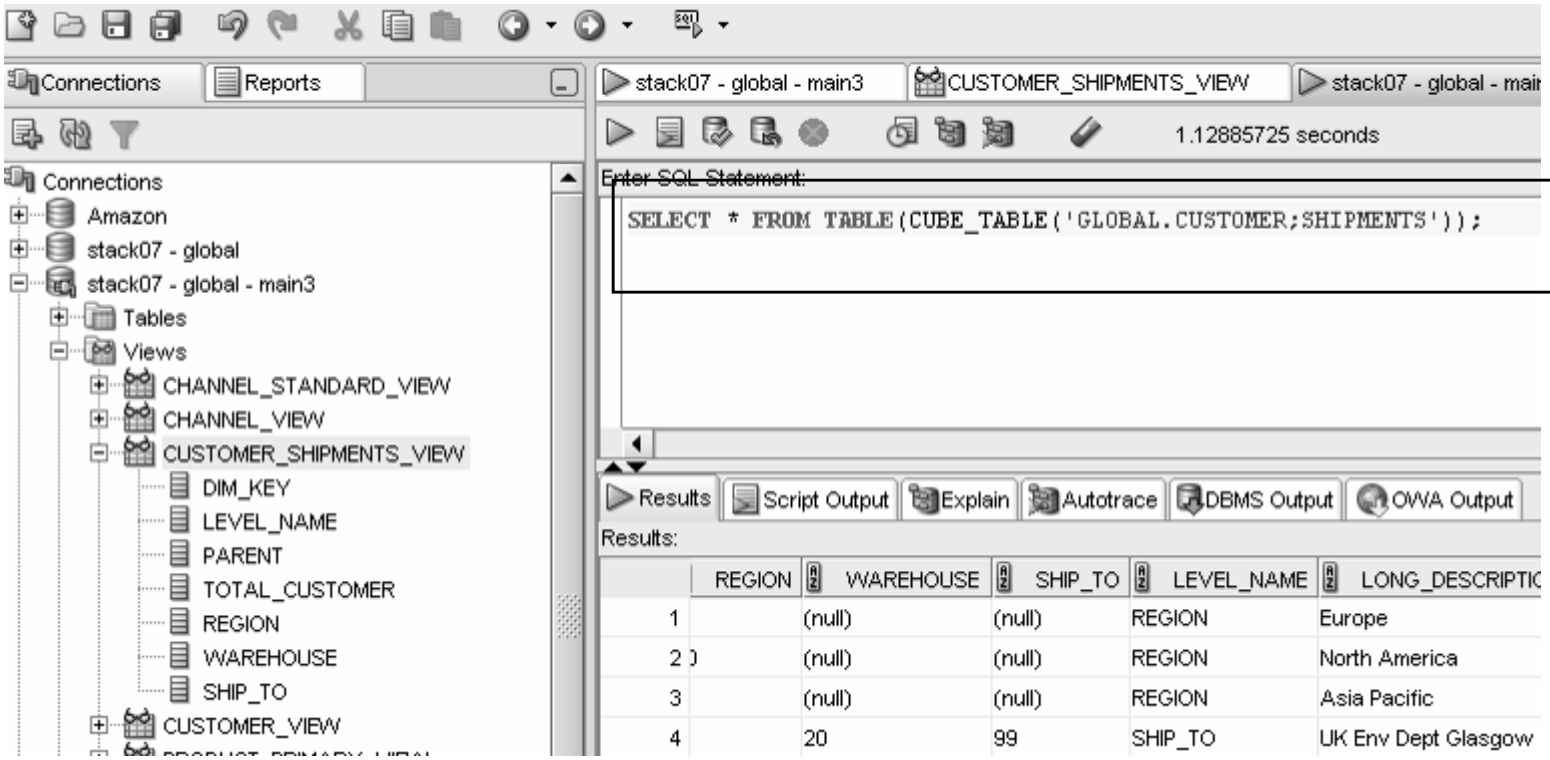
- SQL Query
  - SQL cube scan
  - SQL cube join
  - CUBE_TABLE
  - Optimized looping
  - System maintained dimension and fact views
- SQL-like calculation expressions
- Cost-based aggregation
- Security
  - SQL Grant / Revoke
  - Permit with Extensible Data Security and AWM

Top 11g New OLAP Features

- Cube and maintenance scripts
  - Declarative calculation rules
  - Based on logical model
- All meta data in the Oracle Data Dictionary
  - Dimensional Model
  - Calculation definitions
  - Security policies
  - Data source mappings
  - SQL representation of model

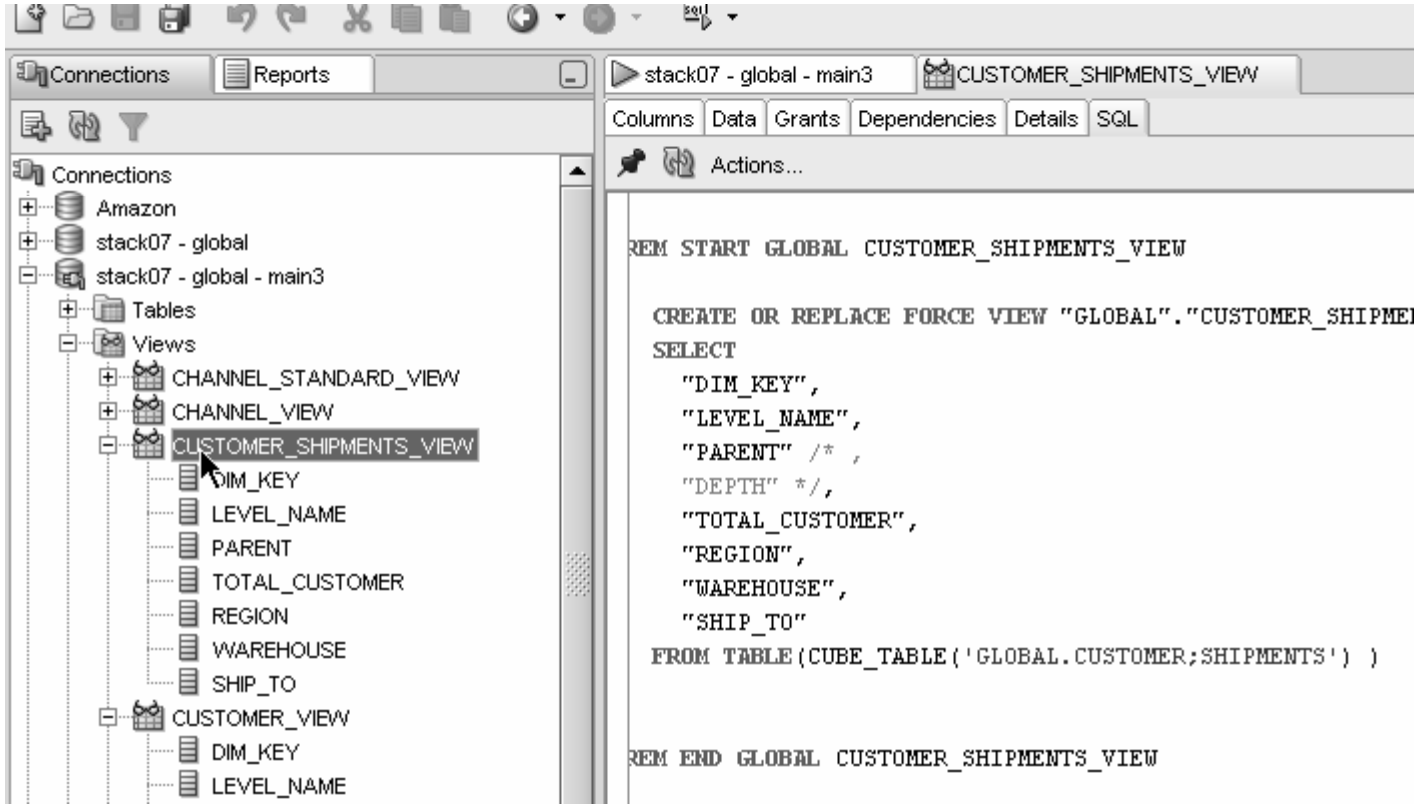
OLAP 11g Changes

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



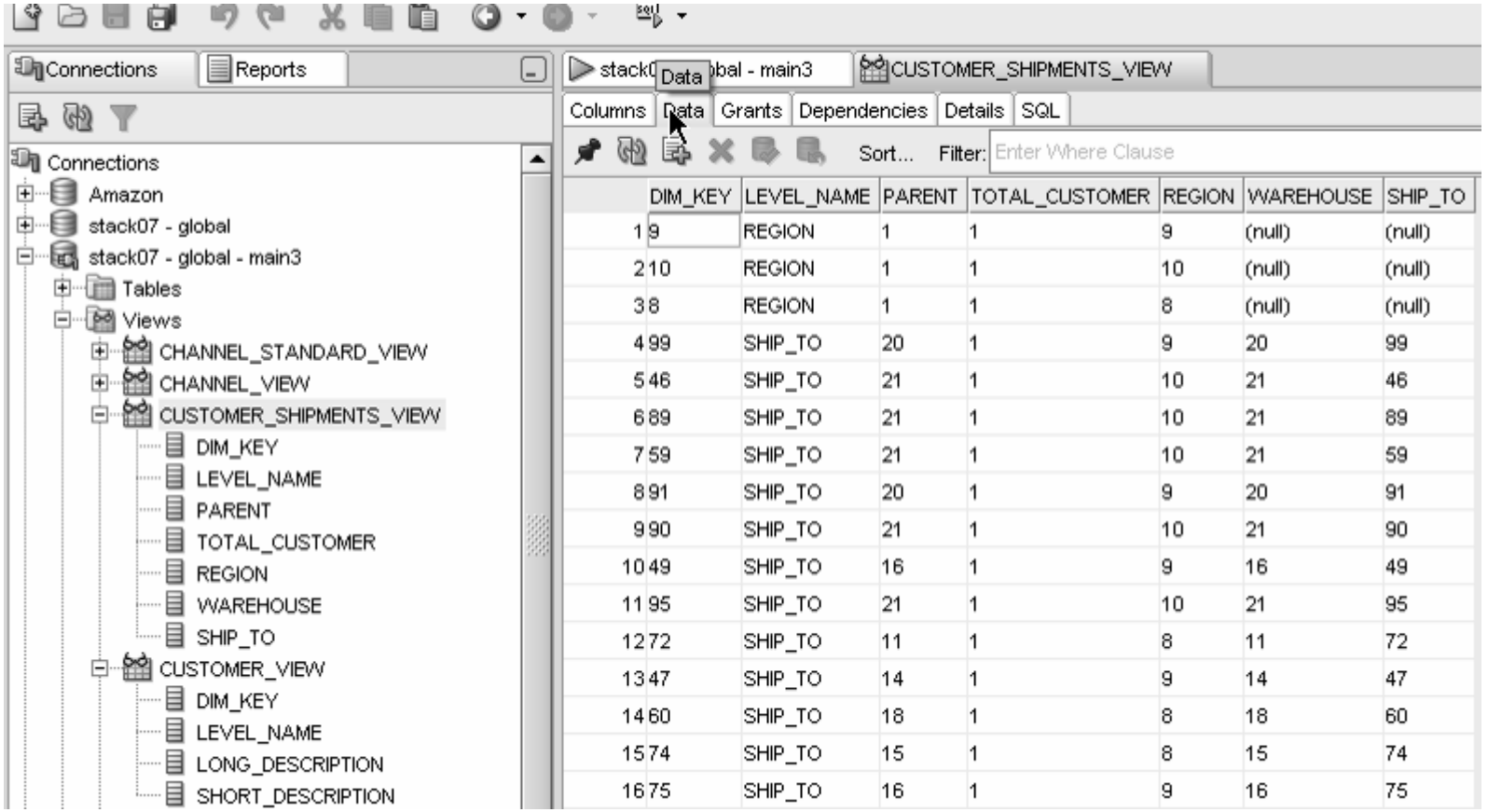
OLAP 11g Changes

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



OLAP 11g Changes

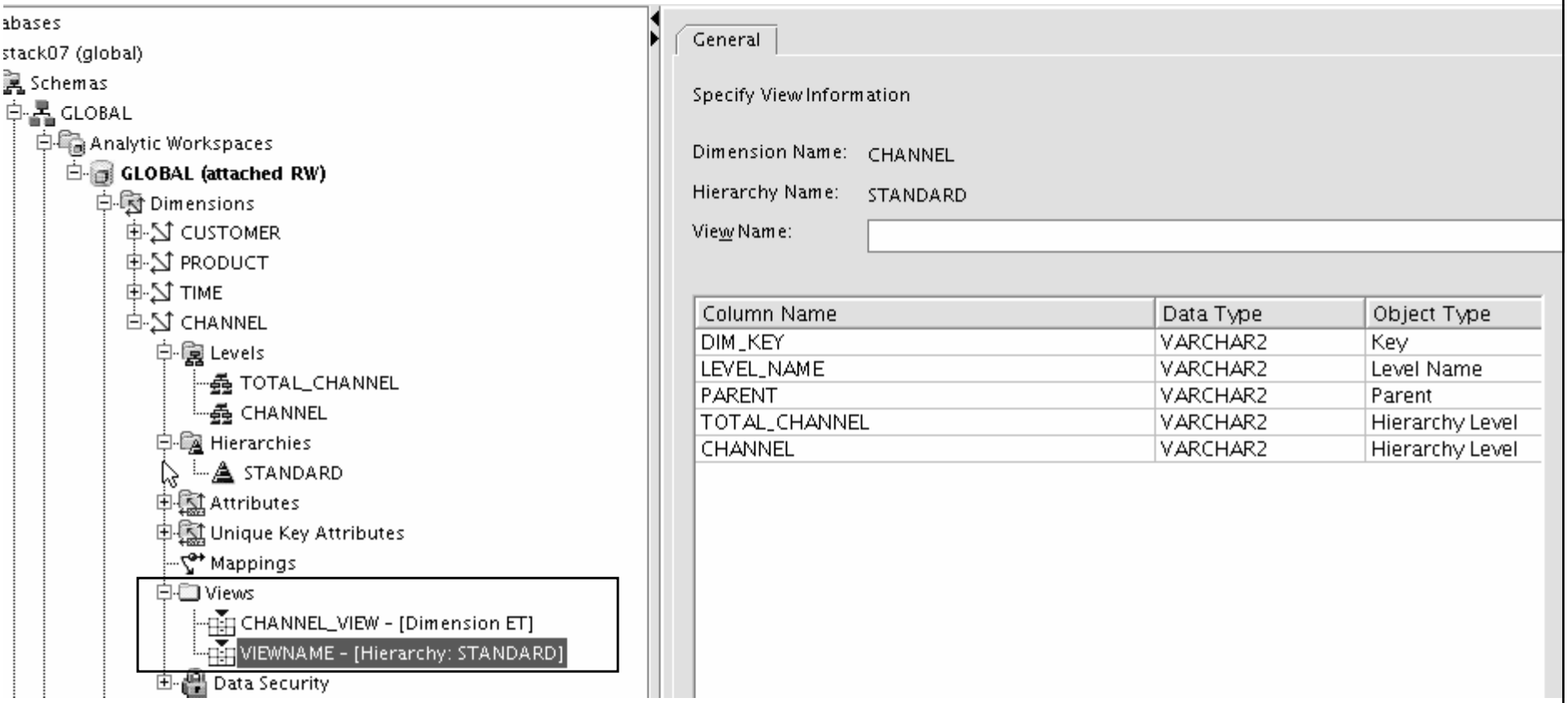
- **Views easily accessed from SQL Developer**



	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

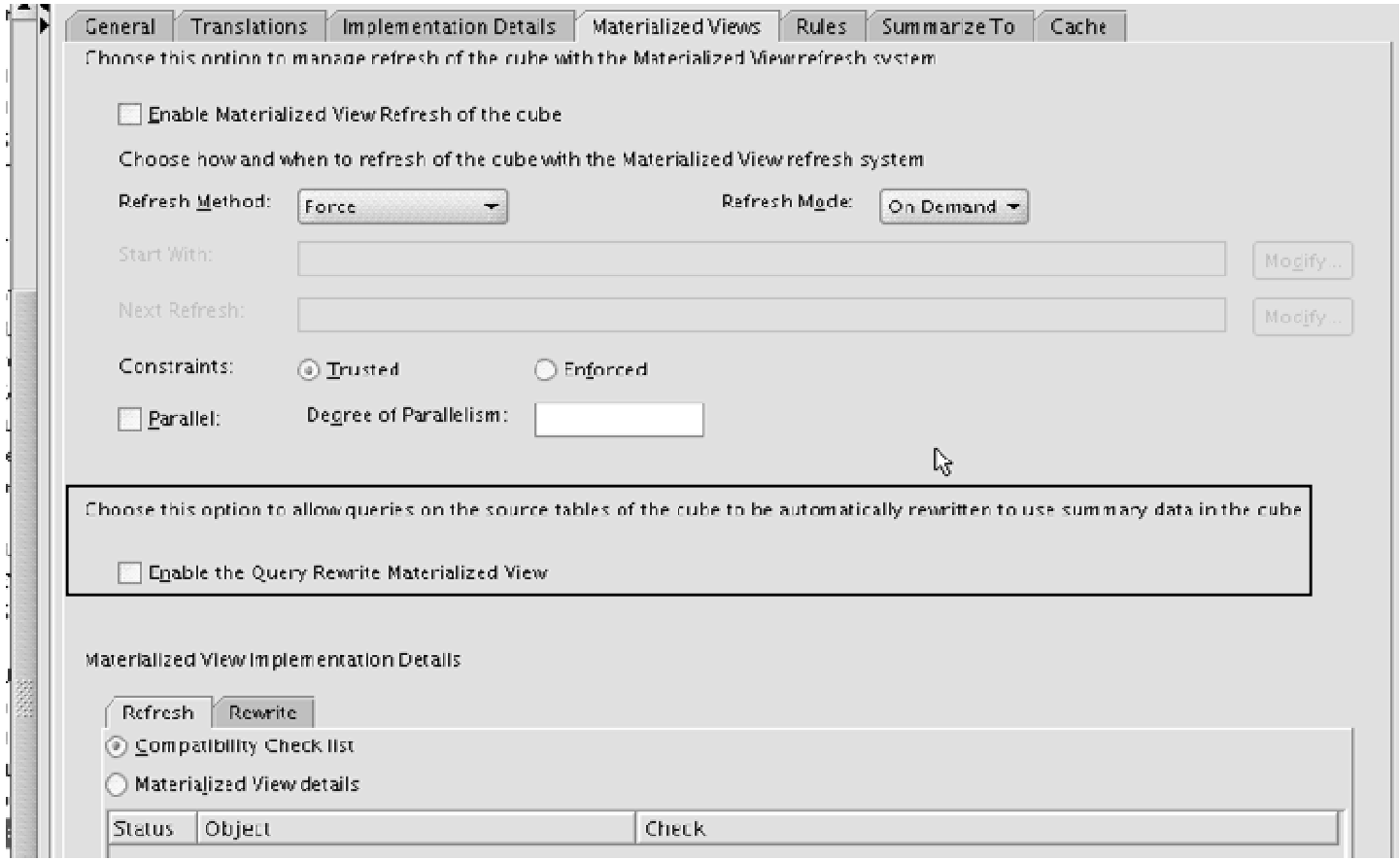
OLAP 11g Changes

- **Automatic views accessible from AWM**



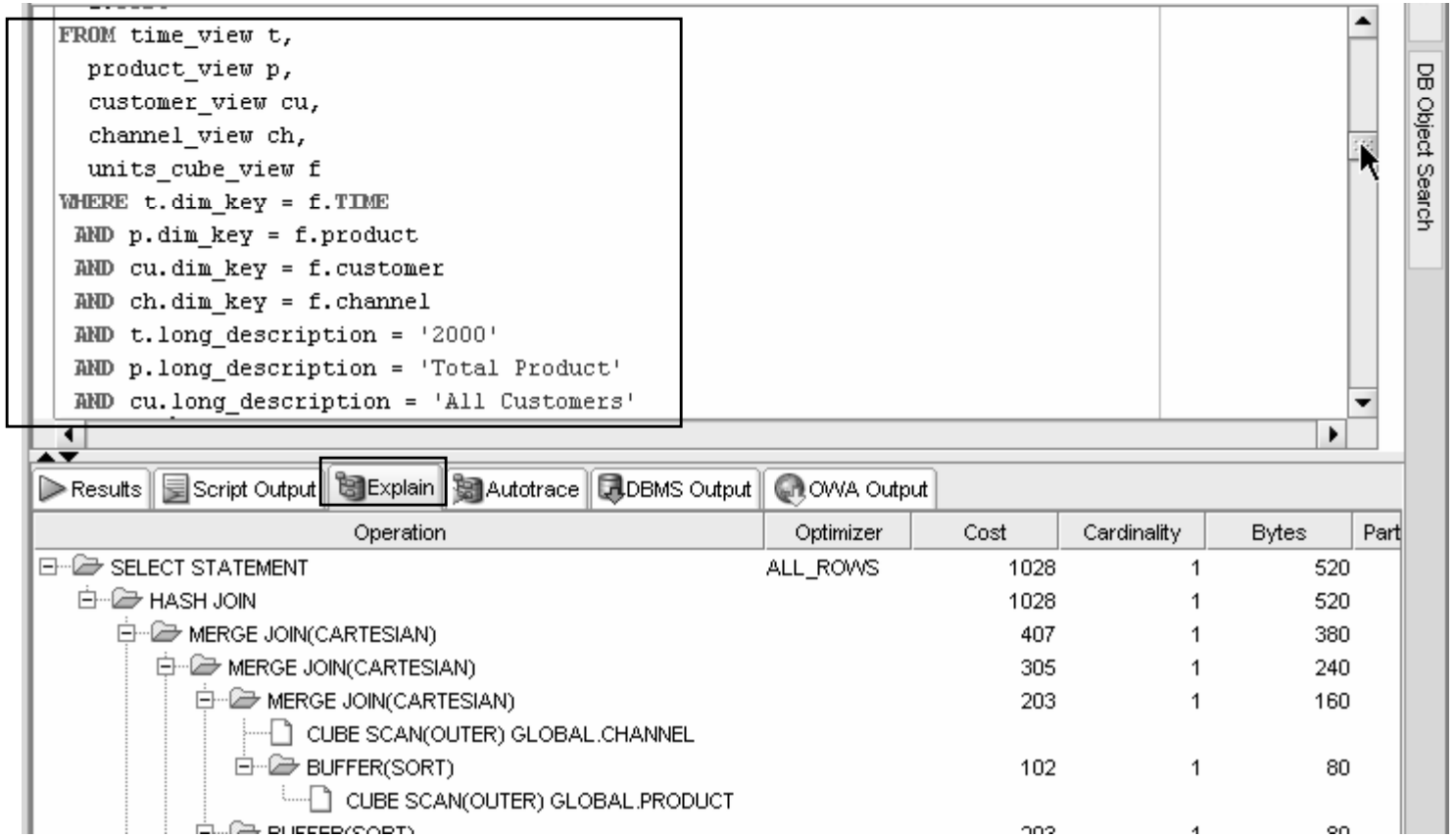
OLAP 11g Changes

- **Query Rewrite knows about AWs now**



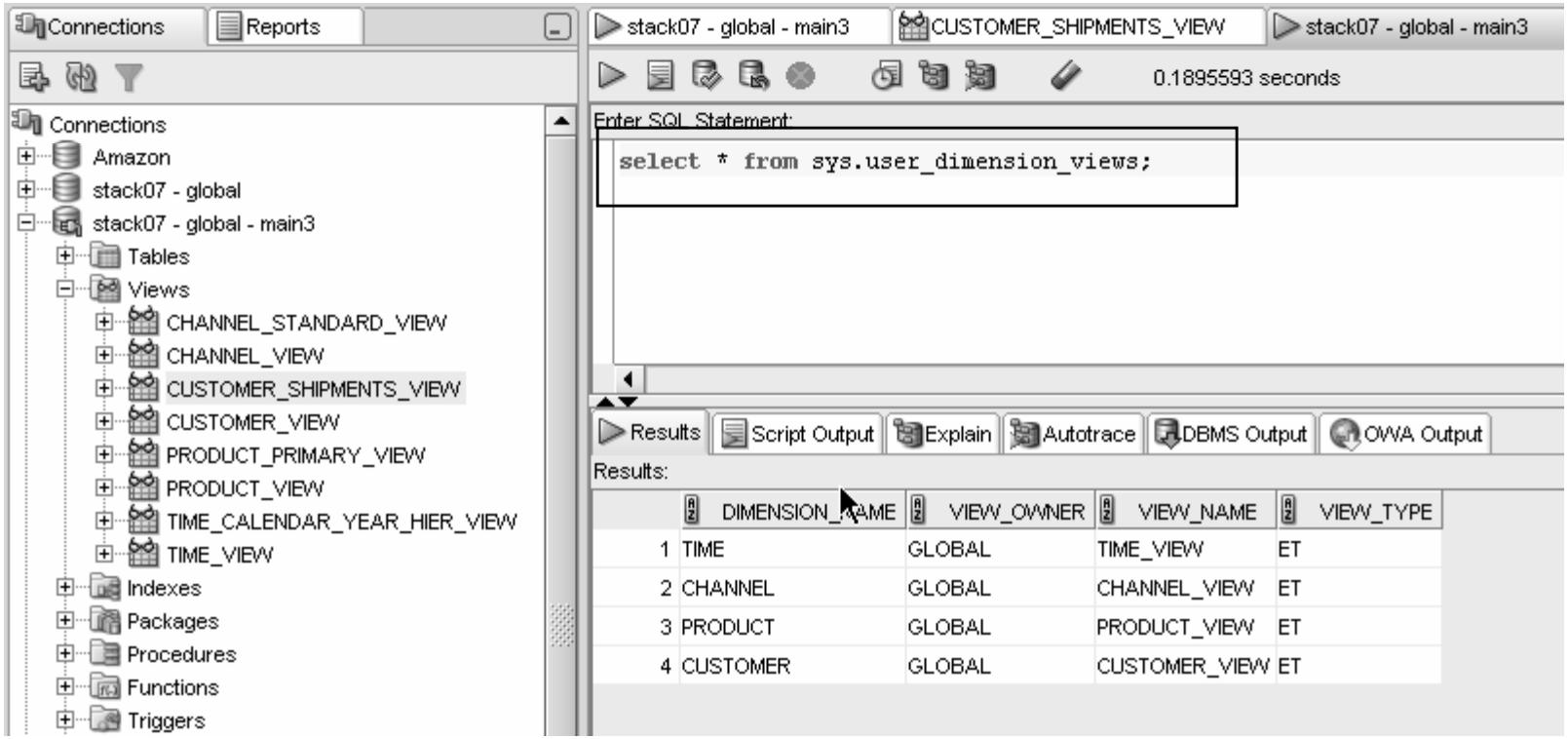
OLAP 11g Changes

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



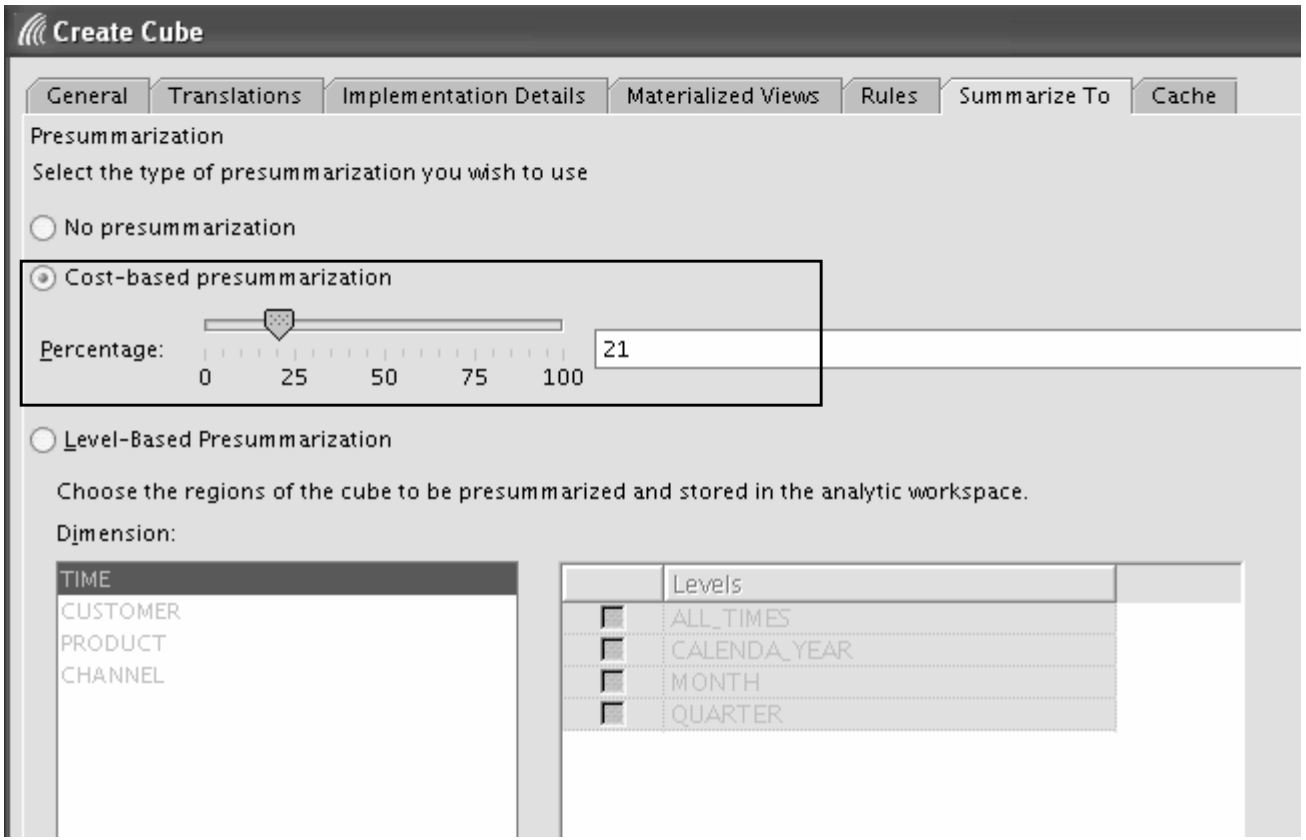
OLAP 11g Changes

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



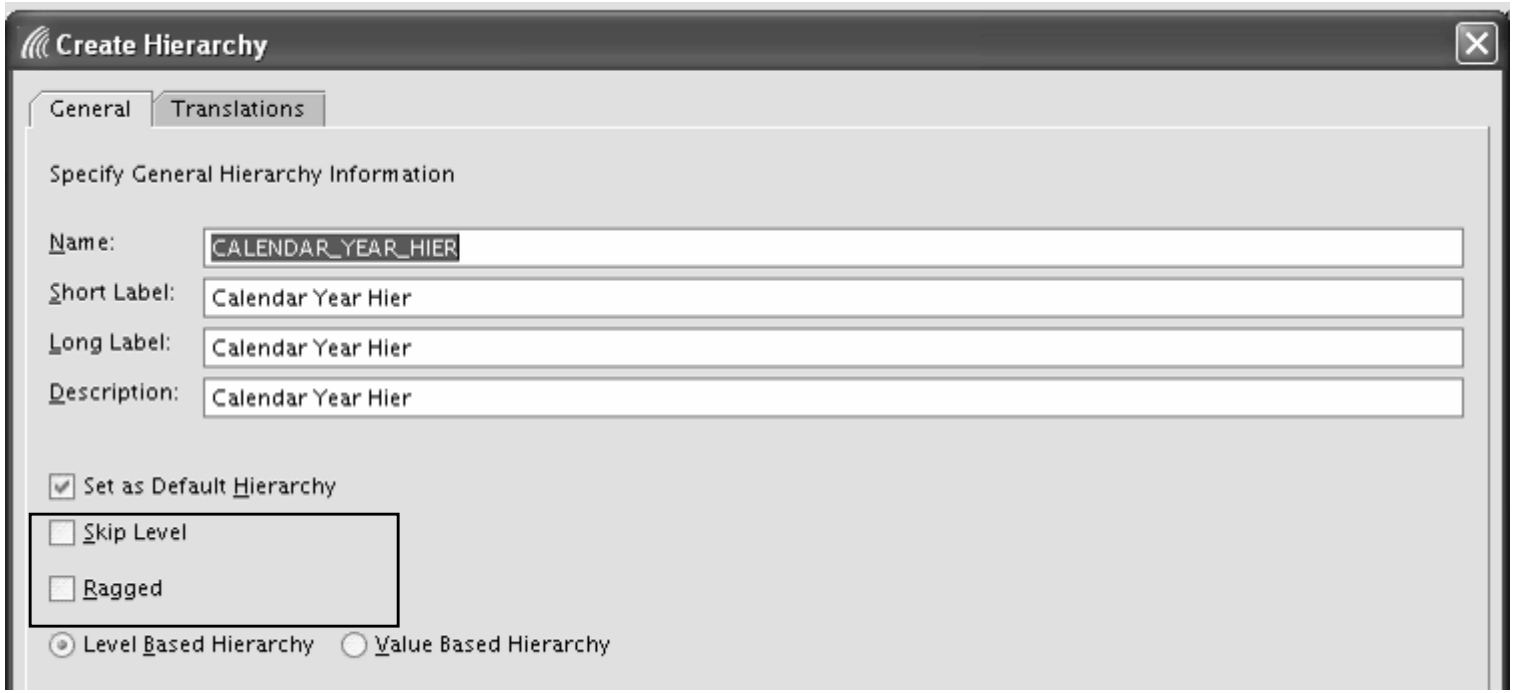
OLAP 11g Changes

- **Cost-based presummarization balances aggregation time with performance**



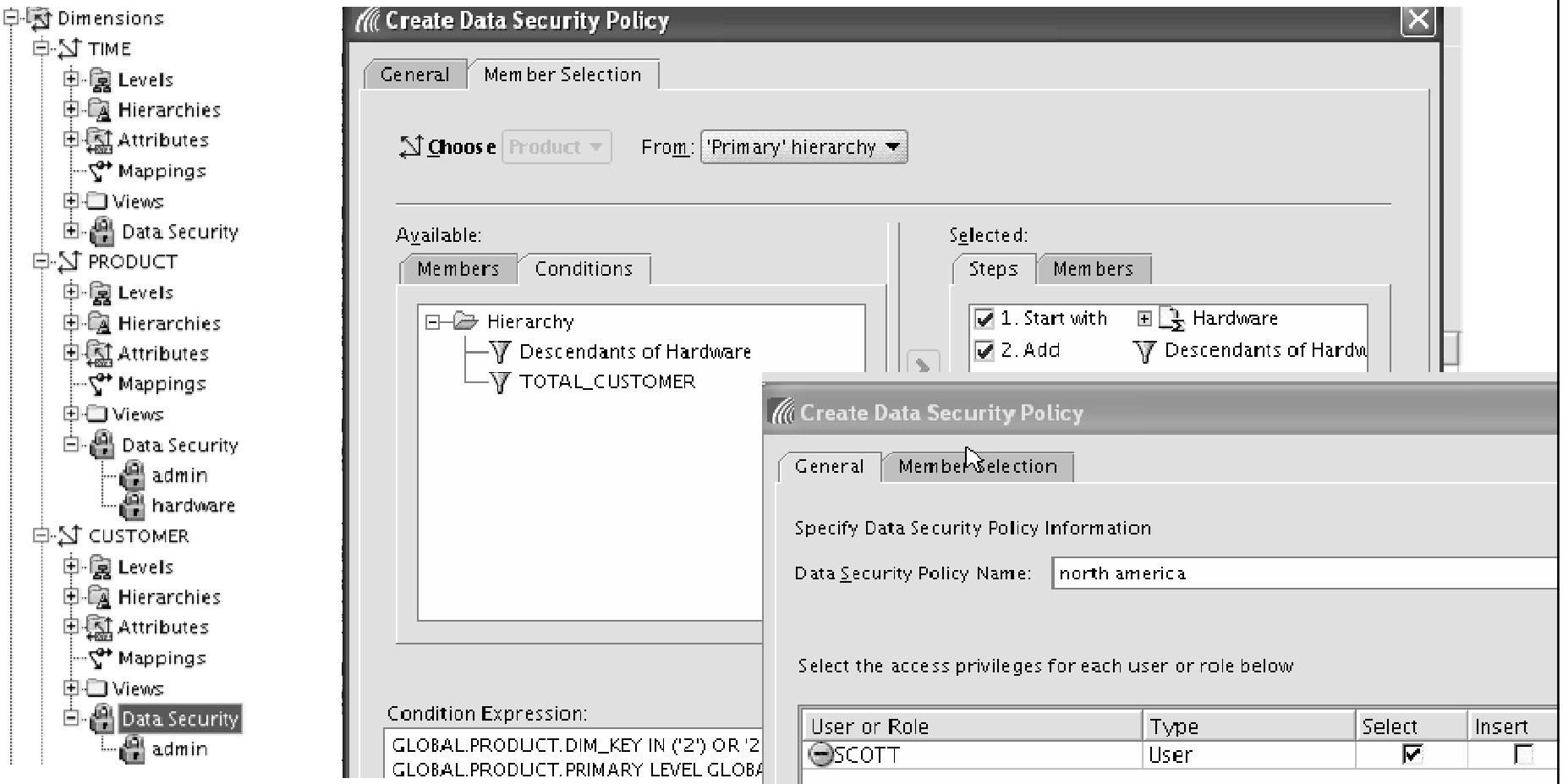
OLAP 11g Changes

- **Native support for AWs with skip level and ragged hierarchies**



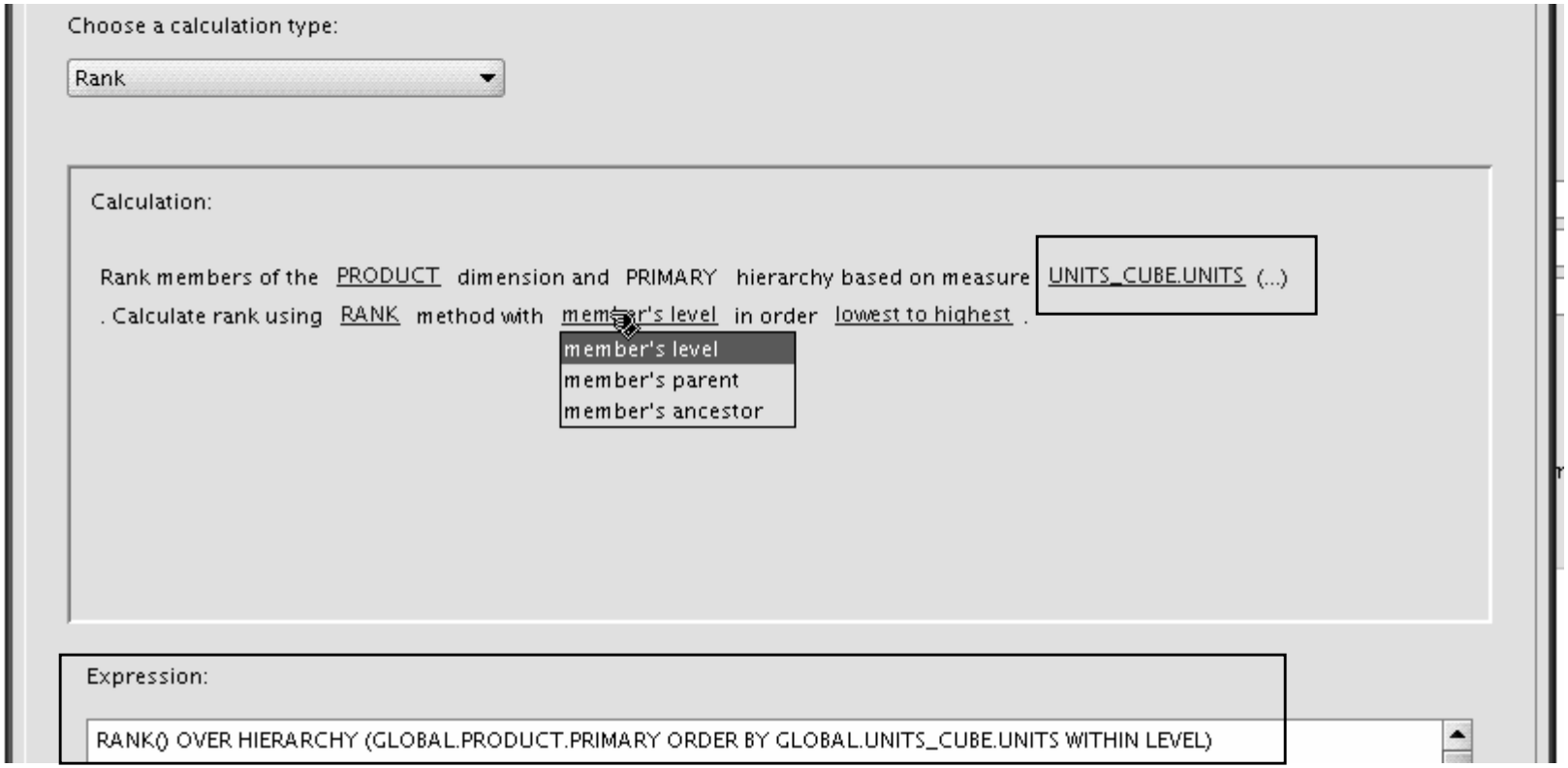
OLAP 11g Changes

- **Create security policies based on hierarchies**



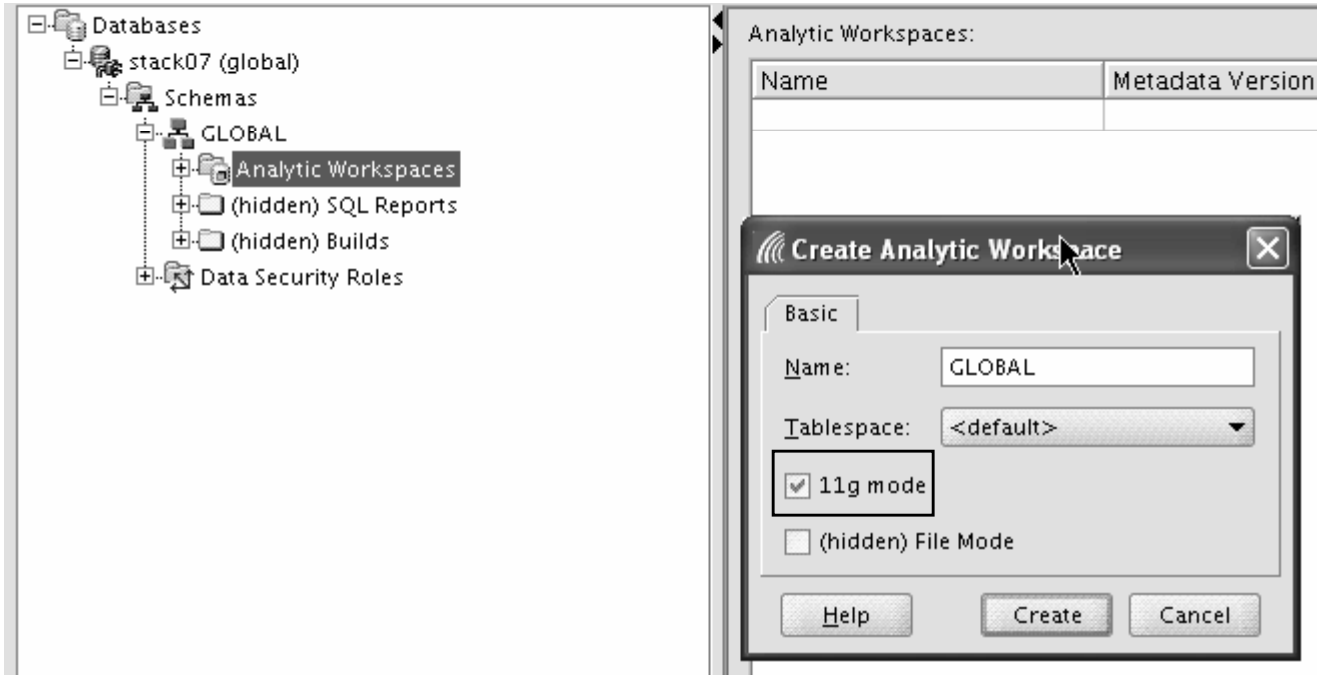
OLAP 11g Changes

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

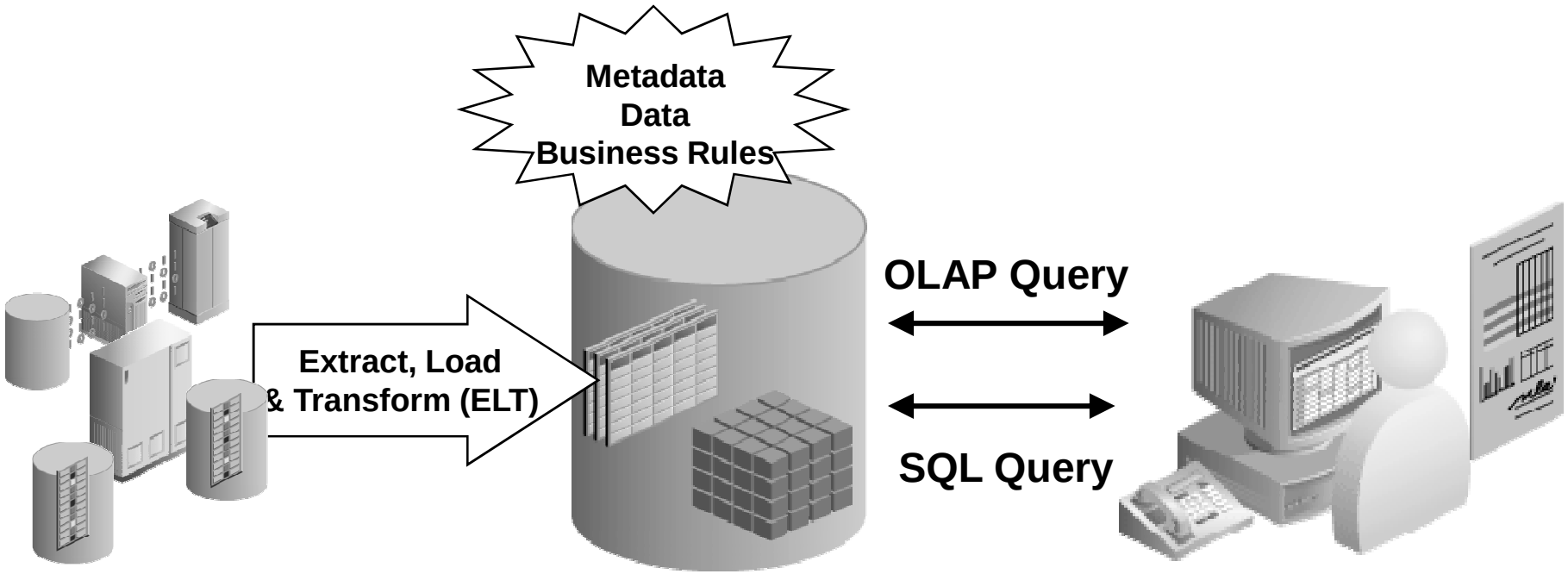


OLAP 11g Changes

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



One Cube, Dimensional or SQL Tools

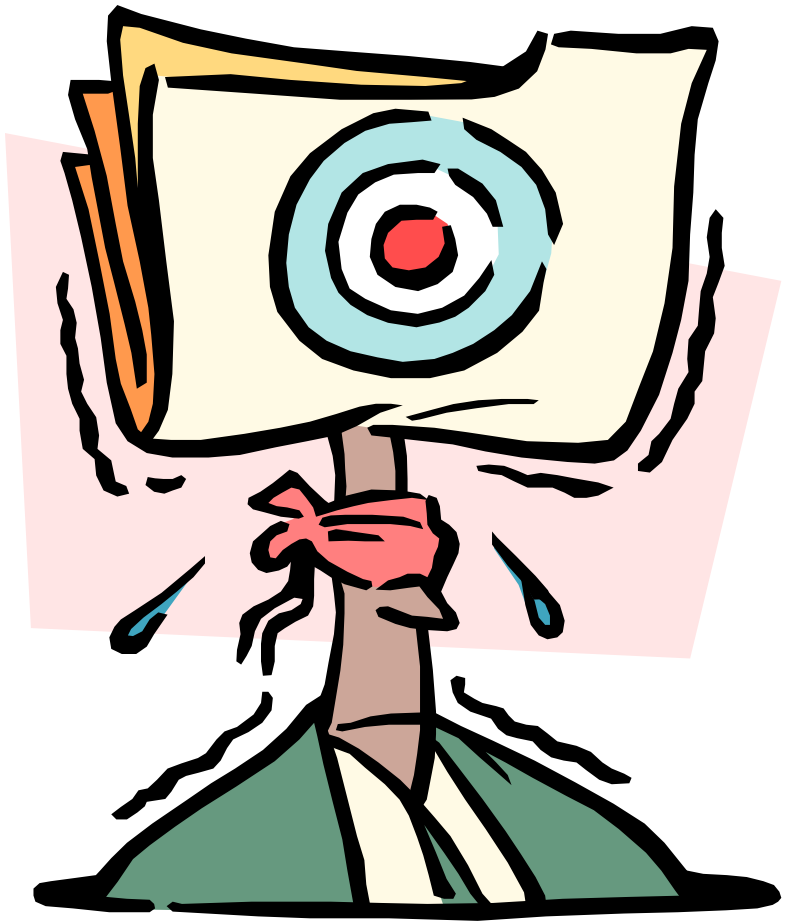


Centrally managed data, meta data and business rules

OBI EE and OLAP Futures

- OBI EE 11g knows about Oracle OLAP
  - Click on cube and deploy in OBI EE
- "Answers Plus" adds OLAP functionality
  - Drill down and drill up within column
  - Additional calculated measure capabilities
  - Driven by feature set in Discoverer Plus
  - Built into OBI EE 11g
  - Features available regardless of source

QUESTIONS?



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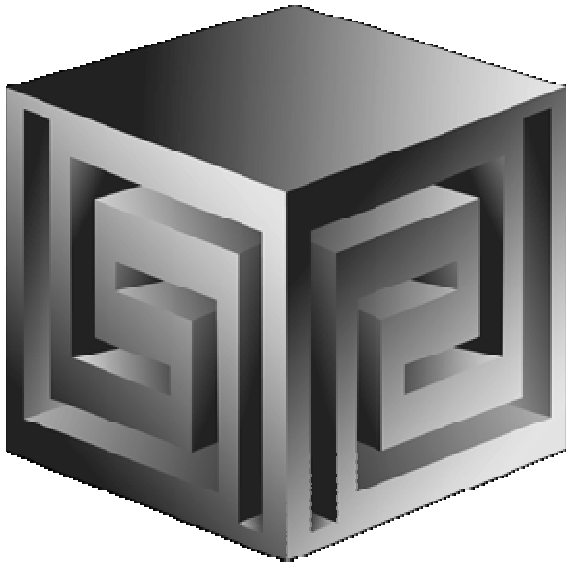

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