Implementing Oracle BI EE on Top of Oracle OLAP Cubes

Collaborate 08 Paper 221 April 16, 2008



Dan Vlamis dvlamis@vlamis.com Vlamis Software Solutions, Inc. 816-781-2880 http://www.vlamis.com

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

Num	Time	Title
U10	Sun, 9-5	How to Use Oracle Business Intelligence (BI) to Solve Real World Problems
207	Mon, 1-2	Oracle BI, Oracle OLAP, Essbase: The Benefits and Cost of Openness
211	Mon, 3:30-4:30	Accelerate Your Oracle DW With OLAP 11g
212	Tues, 9:45-12	Integrating Oracle BIEE with Oracle Analytic Workspaces
219	Tues, 3:30-5:45	Building Cubes and Analyzing Data Using Oracle OLAP 11g
221	Wed, 8:30-9:30	Implementing Oracle BI EE on Top of Oracle OLAP Cubes
223	Wed, 9:45-10:45	Achieving Complex Statistical Modeling with Fast Results Using Oracle OLAP
	Num U10 207 211 212 219 221 223	NumTimeU10Sun, 9-5207Mon, 1-2211Mon, 3:30-4:30212Tues, 9:45-12219Tues, 3:30-5:45221Wed, 8:30-9:30223Wed, 9:45-10:45

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



Are You Smarter Than a 5th Grader?



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Arrays as Defined by a 5th Grader WORD OF THE DAY: Array Explain or demonstrate your understanding of the vocabulary word in the box below. An arrangement of objects in a Pattern an example rows and Celuns

Courtesy Alexander Doniphan Elementary School, Liberty, Missouri



BI EE Metadata Editor

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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



- 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.

Month. State

Year. Continent

The SQL Optimizer automatically rewrites queries to access MV's whenever possible





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
 - □ <u>http://www.oracle.com/bi</u>
- 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
 - □ <u>http://www.vlamis.com/demo</u>

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



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

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

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• Views easily accessed from SQL Developer

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		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
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		16	75	SHIP_TO	16	1	9	16	75



• Automatic views accessible from AWM

abases	General		
iackor (global)] Schemas 白-晃 GLOBAL	Specify View Information		
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• Query Rewrite knows about AWs now

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



- Views are stored in Oracle Dictionary
- Notice in <u>SYS</u>.USER_DIMENSION_VIEWS

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• Cost-based presummarization balances aggregation time with performance

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TIME	-



• Native support for AWs with skip level and ragged hierarchies

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• Create security policies based on hierarchies

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		Copyright © 2007,	, Vlamis Software S	Solutions, I	nc.



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

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ank members of the	PRODUCT dimensi	on and PRIMARY H	hierarchy based on measu	re <u>UNITS_CUBE.UNITS</u> ()	
Calculate rank using	<u>RANK</u> method with	member's level member's parent member's ancest	or		



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

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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



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