

OLAP Is Different From What You Think

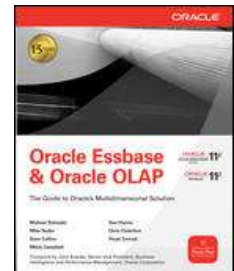
Rittman Mead BI Forum Spring 2012

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Dan VlamiS and VlamiS Software Solutions

- VlamiS Software founded in 1992 in Kansas City, Missouri
- Developed more than 200 Oracle BI systems
- Specializes in ORACLE-based:
 - Data Warehousing
 - Business Intelligence
 - Design and integrated BI and DW solutions
 - Training and mentoring
- Expert presenter at major Oracle conferences
- www.vlamiS.com (blog, papers, newsletters, services)
- Developer for IRI (former owners of Oracle OLAP)
- Co-author of book “Oracle Essbase & Oracle OLAP”
- Beta tester for OBIEE 11g
- Reseller for Simba and NAVTEQ map data for OBIEE
- HOL Coordinator for 2012 Collaborate Conference





Perceptions of OLAP

Perception

- Relational can do anything
- Hard to do
- Should be driven by IT
- Takes specialized software
- Not necessary anymore

Reality

- Summary management takes planning
- Easy, just different
- Should be driven by user community
- Works with SQL, MDX, etc.
- Always important to design properly



OLAP Is Fast For Dimensional Queries

- Dimensions are natural indexes to data
- Dimensions are natural way to look at data
 - By, across, over, down – prepositions are often dimensions
- Handles multiple levels easily – embedded total hierarchies
- Inter-row calcs are easy
 - Share, index
 - Yr/yr or prior period comparison
 - Movingtotal



Dimensions Are Key to OLAP Model

- OLAP good at unpredictable query pattern if query fits dimensions of data
- Don't confuse limitations of pre-calculated data with limitations of OLAP
- If filter invalidates OLAP, likely invalidates summary table logic
- Example: Sales by Region (easy)
- Hard: Sales by Region for stores open > 1 yr
- If demand ultimate flexibility, must calc on the fly and performance will be a problem if accessing lots of data



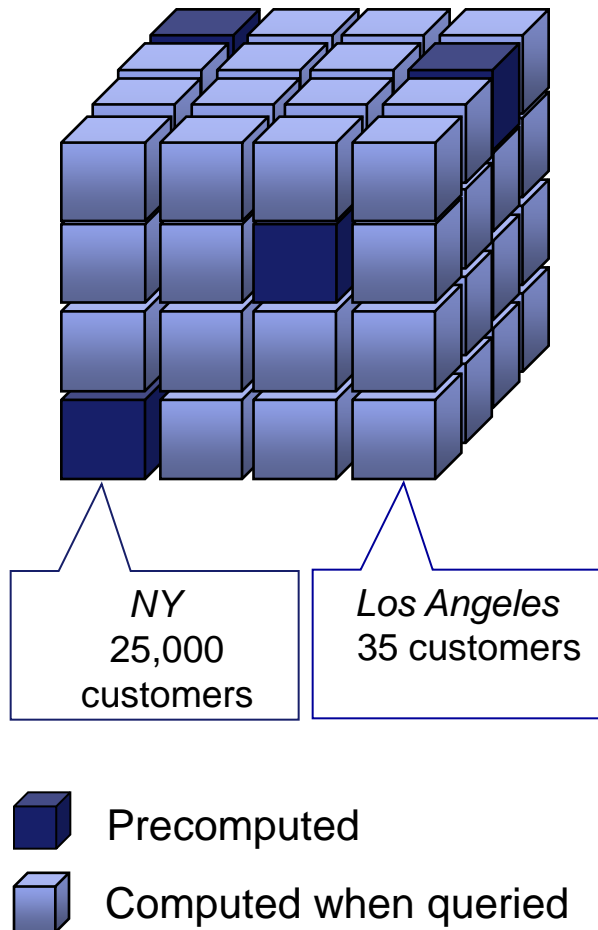
Aggregate Data Problem

- Relational good at homogenous key data
- Dimensions handle data at multiple levels
 - E.g. Day -> Month -> Quarter -> Year
 - Single key column has values at each level
- In Relational, aggregate data via views/agg tables
- In Cubes, aggregate data all in one table
- Queries return data at many levels in SQL statement
- Aggregation logic in OLAP cubes – simplifies queries
- Cost-based aggregation will calculate what levels to agg on the fly vs. store aggregates



Cost Based Aggregation

Pinpoint Summary Management



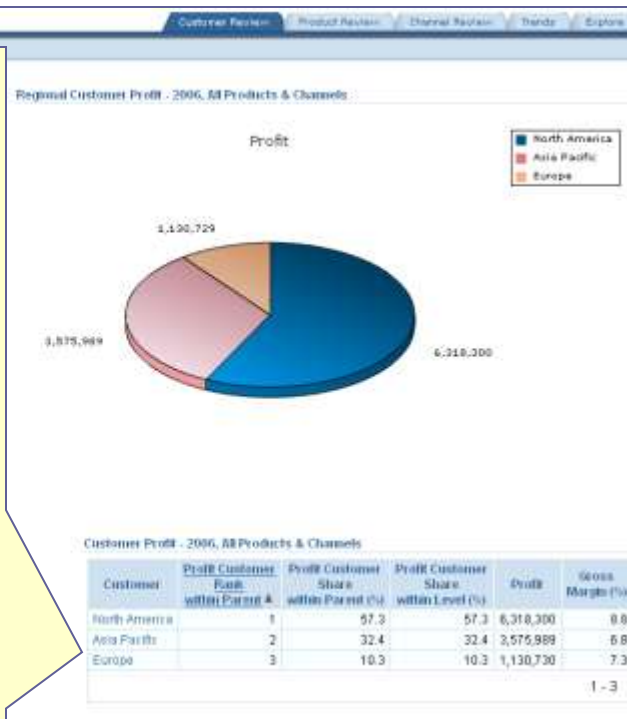
- Improves aggregation speed and storage consumption by pre-computing cells that are most expensive to calculate
- Easy to administer
- Simplifies SQL queries by presenting data as fully calculated



Empowering Any SQL-Based Tool

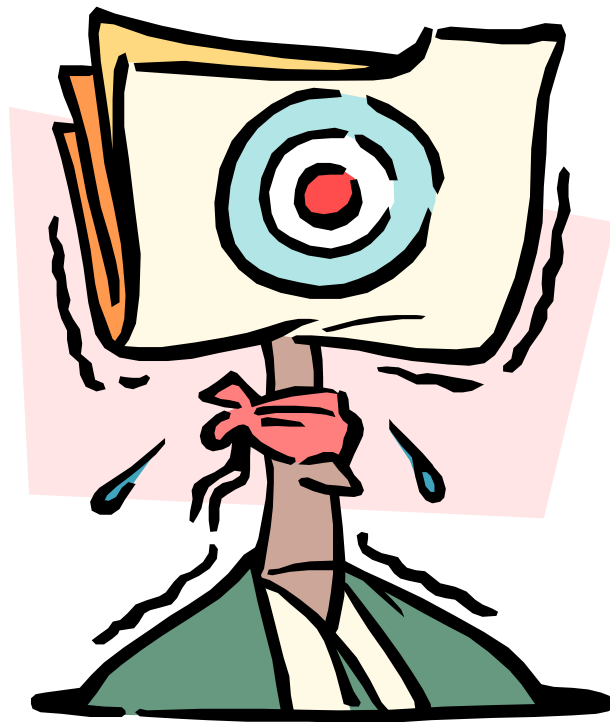
Leveraging the OLAP Calculation Engine

```
SELECT cu.long_description customer,  
       f.profit_rank_cust_sh_parent,  
       f.profit_share_cust_sh_parent,  
       f.profit_rank_cust_sh_level,  
       f.profit,  
       f.gross_margin  
FROM time_calendar_view t,  
     product_primary_view p,  
     customer_shipments_view cu,  
     channel_primary_view ch,  
     units_cube_view f  
WHERE t.level_name = 'CALENDAR_YEAR'  
      AND t.calendar_year = 'CY2006'  
      AND p.dim_key = 'TOTAL'  
      AND cu.parent = 'TOTAL'  
      AND ch.dim_key = 'TOTAL'  
      AND t.dim_key = f.TIME  
      AND p.dim_key = f.product  
      AND cu.dim_key = f.customer  
      AND ch.dim_key = f.channel;
```





QUESTIONS?





Essbase vs. Oracle OLAP

Essbase

- Separate server
- List price* \$184K/CPU
- Separate admin
- Administer by LoB
- Must build cubes
- Part of middle tier
- Excellent writeback
- Query via MDX, XML/A

Oracle OLAP

- Built into Oracle DB
- List price* DB + \$23K/CPU
- Admin same as Oracle DB
- Administer by IT
- Must build cubes
- Part of server tier
- Limited writeback
- Query via SQL (now MDX)

* <http://www.oracle.com/us/corporate/pricing/index.html>



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Enter SQL Statement:

```
-- *****  
-- 2: Sales by Class (Channel), Department (Product), and Quarters in 2009.  
-- A geography column is not in query, so the "ALL_REGIONS" condition  
-- must be added in order to leverage aggregation over geography.  
  
SELECT c.long_description as channel,  
       p.long_description as product,  
       t.long_description as time,  
       round(s.sales) as sales  
FROM channel_sales_channel_view c,  
     product_standard_view p,  
     geography_regional_view g,  
     time_calendar_view t,  
     sales_cube_view s  
WHERE (c.dim_key = s.channel -- \  
      AND g.dim_key = s.geography -- Join Cube and  
      AND p.dim_key = s.product -- Dimension views  
      AND t.dim_key = s.TIME -- /  
      AND g.level_name = 'ALL_REGIONS' --> LEVEL_NAME can be used for "All" condition  
      AND c.level_name = 'CLASS' -- \  
      AND p.level_name = 'DEPARTMENT' -- "Level" conditions for other dims  
      AND t.level_name in ('CALENDAR_QUARTER', 'CALENDAR_YEAR') -- /  
      AND t.calendar_year_long_descr = 'CY2009') --> Time filtered for 2009 only  
ORDER BY c.long_description, p.long_description, t.end_date;
```

Results Script Output Explain Autotrace DBMS Output OWA Output

Results:

	CHANNEL	PRODUCT	TIME	SALES
1	Direct	Cameras and Camcorders	Q1-CY2009	1242385
2	Direct	Cameras and Camcorders	Q2-CY2009	1125521
3	Direct	Cameras and Camcorders	Q3-CY2009	1354490
4	Direct	Cameras and Camcorders	CY2009	5165424
5	Direct	Cameras and Camcorders	Q4-CY2009	1443028
6	Direct	Computers	Q1-CY2009	13917490
7	Direct	Computers	Q2-CY2009	11756607
8	Direct	Computers	Q3-CY2009	12865030
9	Direct	Computers	Q4-CY2009	14308176
10	Direct	Computers	CY2009	52847303
11	Direct	Portable Music and Video	Q1-CY2009	1945639
12	Direct	Portable Music and Video	Q2-CY2009	1666430

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Enter SQL Statement:

```
SELECT c.long_description as channel,
       p.long_description as product,
       t.long_description as time,
       round(s.sales) as sales,           -- sales
       round(s.sales_ytd) as ytd,         -- sales year to date (YTD)
       round(s.sales_ytd_pctchg_pp, 2) as "ytd % chg prior year", -- sales YTD compared to last year
       round(s.sales_2008) as sales_2008, -- sales for all of 2008
       round(s.to_go) as to_go,           -- absolute sales required to achieve 2008 revenue.
                                           -- This is based on year to date sales compared to 2008
       round(s.pct_of_2008) as pct_of_2008, -- ytd sales as a % of 2008 sales
       how_is_sales_ytd,                  -- How is sales performing YTD (compared to last year)
                                           -- sales last year
       round(s.sales_yr_ago) as sales_pr_year,
       round(s.sales_pctchg_yr_ago, 2) as "% chg prior year", -- % change sales last year
       product_alert                      -- Alert if year over year sales ha

FROM channel_sales_channel_view c,
     product_standard_view p,
     geography_regional_view g,
     time_calendar_view t,
     sales_cube_view s
WHERE (c.dim_key = s.channel
      AND g.dim_key = s.geography
      AND p.dim_key = s.product
      AND t.dim_key = s.TIME
      AND g.level_name = 'ALL_REGIONS'
      AND c.level_name = 'CLASS'
      AND p.level_name = 'DEPARTMENT'
      AND t.level_name = 'CALENDAR_QUARTER'
      AND t.calendar_year_long_descr = 'CY2009')
ORDER BY channel, product, t.end_date;
```

Results Script Output Explain Autotrace DBMS Output OWA Output

Results:

	CHANNEL	PRODUCT	TIME	SALES	YTD	ytd % c...	SALES_2008	TO_GO	PCT_OF_2008	HOW_IS_SA...	SALES_PR_YEAR	% chg pri...	PRODUCT_ALERT
1	Direct	Cameras and Ca...	Q1-CY2009	1242385	1242385	1.62	4372207	3129821	28	On track	1222587	1.62	ALERT
2	Direct	Cameras and Ca...	Q2-CY2009	1125521	2367906	8.52	4372207	2004301	54	On track	959410	17.31	OKAY
3	Direct	Cameras and Ca...	Q3-CY2009	1354490	3722396	16.21	4372207	649811	85	Outstanding ...	1021252	32.63	OKAY
4	Direct	Cameras and Ca...	Q4-CY2009	1443028	5165424	18.14	4372207	-793217	118	Outstanding ...	1168958	23.45	OKAY
5	Direct	Computers	Q1-CY2009	13917490	13917490	18.78	46459972	32542482	30	Outstanding ...	11716674	18.78	OKAY
6	Direct	Computers	Q2-CY2009	11756607	25674097	17.92	46459972	20785875	55	Outstanding ...	10056440	16.91	ALERT
7	Direct	Computers	Q3-CY2009	12865030	38539127	15.25	46459972	7920845	83	Outstanding ...	11667335	10.27	ALERT