



# **Working with OLAP Data Sources in BusinessObjects Enterprise 6.5 and XIr2**

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## Objectives

- To provide an introductory overview to OLAP servers
  - using SQL Server 2000 Analysis Services by way of example
- To provide an introductory overview to working with OLAP server data in BusinessObjects Enterprise 6.5 and XIr2
  - a lesser used area of the product suite ?



## Contents

- What is OLAP ?
- OLAP Architecture
- OLAP with BusinessObjects 6.5
- OLAP with BusinessObjects XIr2
- Summary



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## What is OLAP ?

- **O**n-**L**ine **A**nalytical **P**rocessing
- On-line **retrieval** and **analysis** of data to reveal business **trends** and **statistics** not directly visible in the data retrieved from a data warehouse.
- Also known as **multidimensional** analysis.



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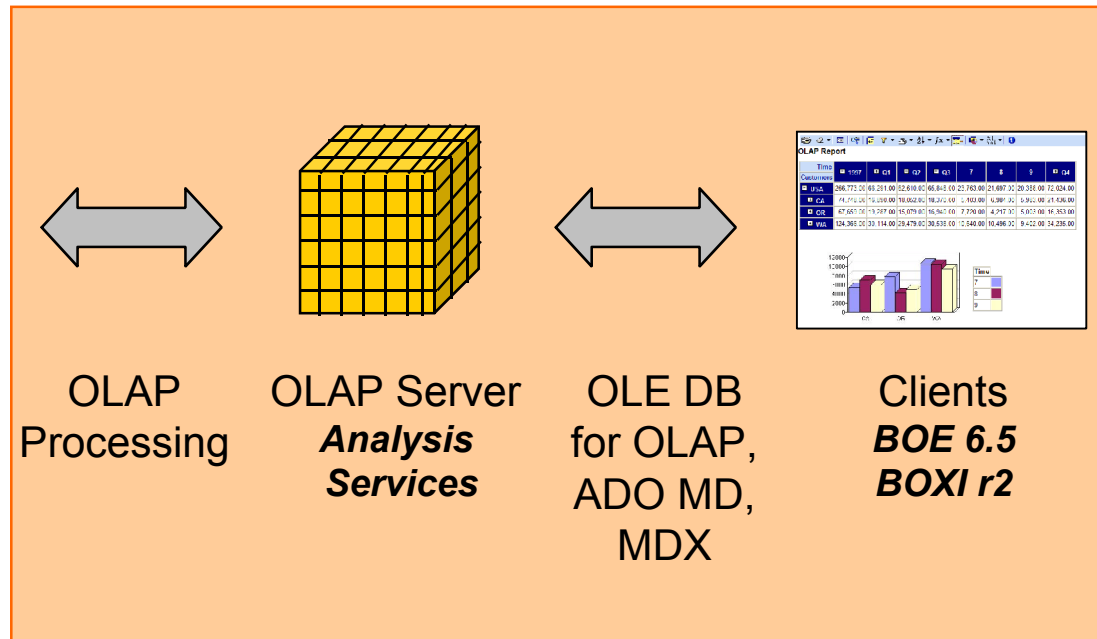
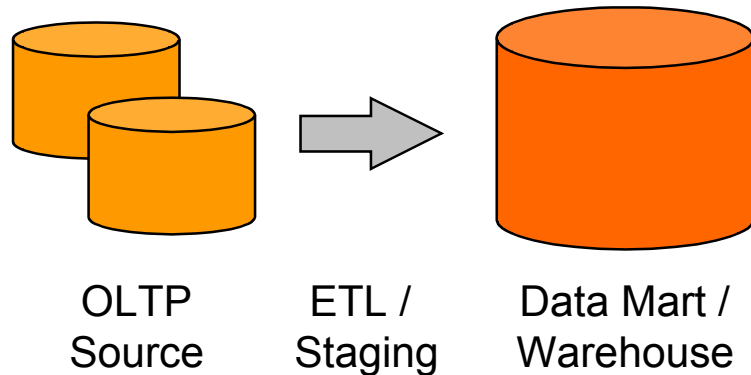


## Supported OLAP Servers

- ***Check PARs / Platforms.txt for latest information***
- **Hyperion Essbase Server (up to 7.1)**
- **IBM DB2 OLAP Server (up to 8.2)**
- **SAP BW Server (up to 3.5)**
- **MS SQL Server 2000 Analysis Services (up to SP3)**
- **Oracle OLAP Express (up to 6.3) - 6.5 Full client only**

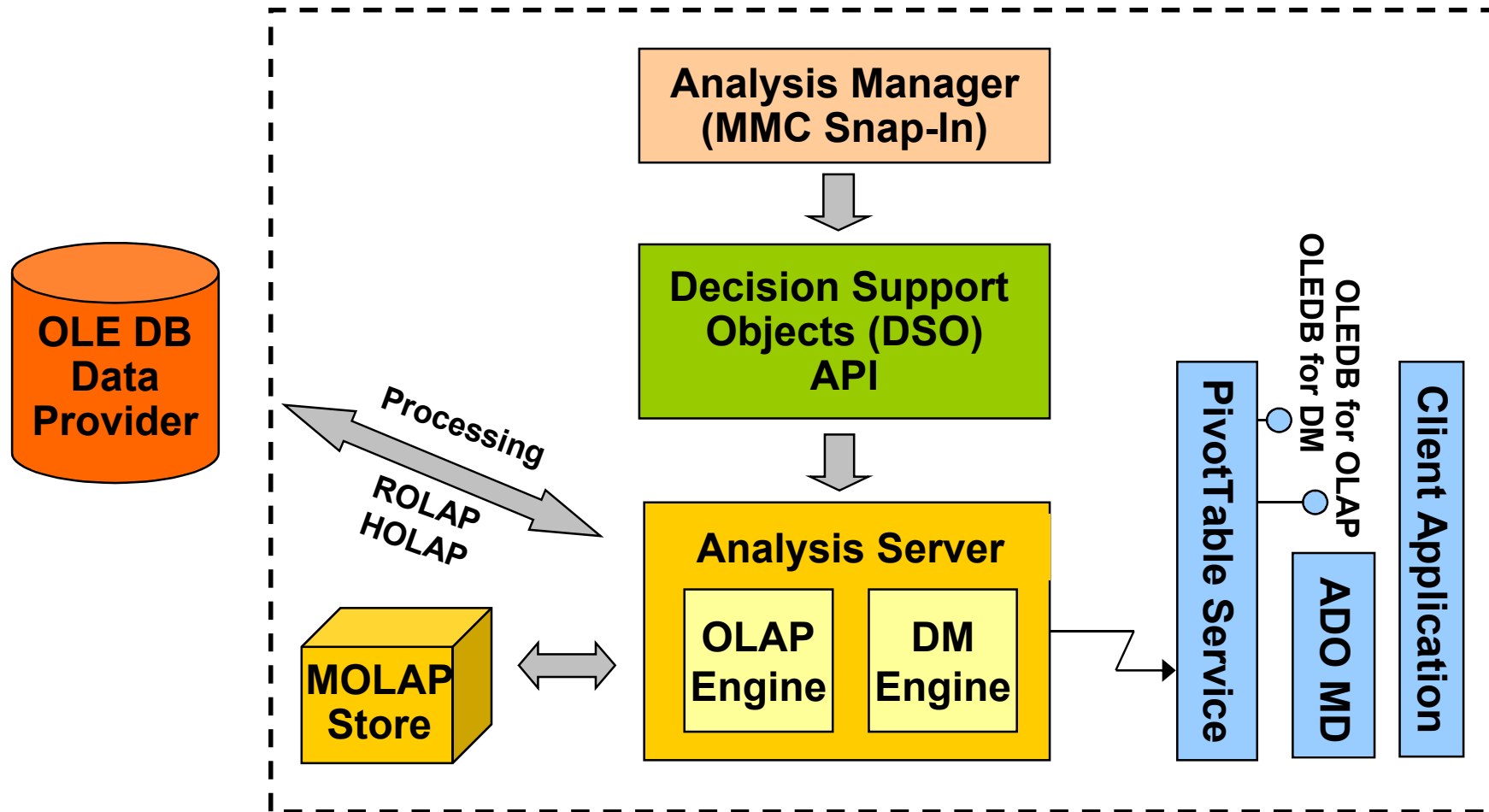


# Basic Data Warehousing Architecture



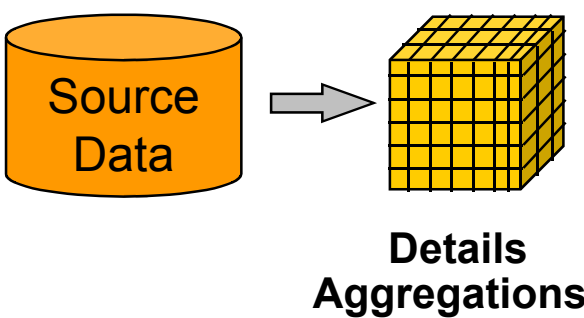
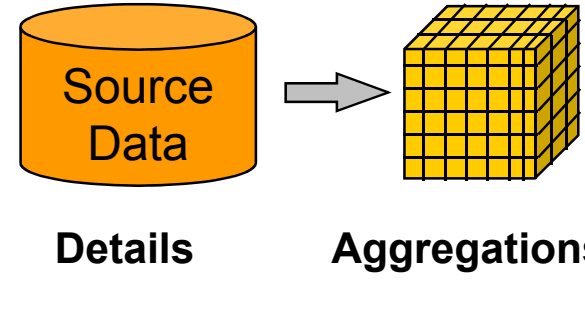
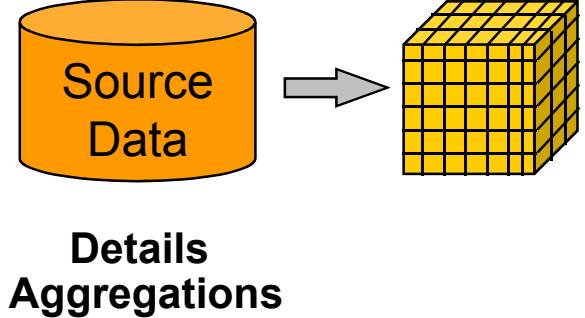


# MS SQL Server 2000 Analysis Services Architecture





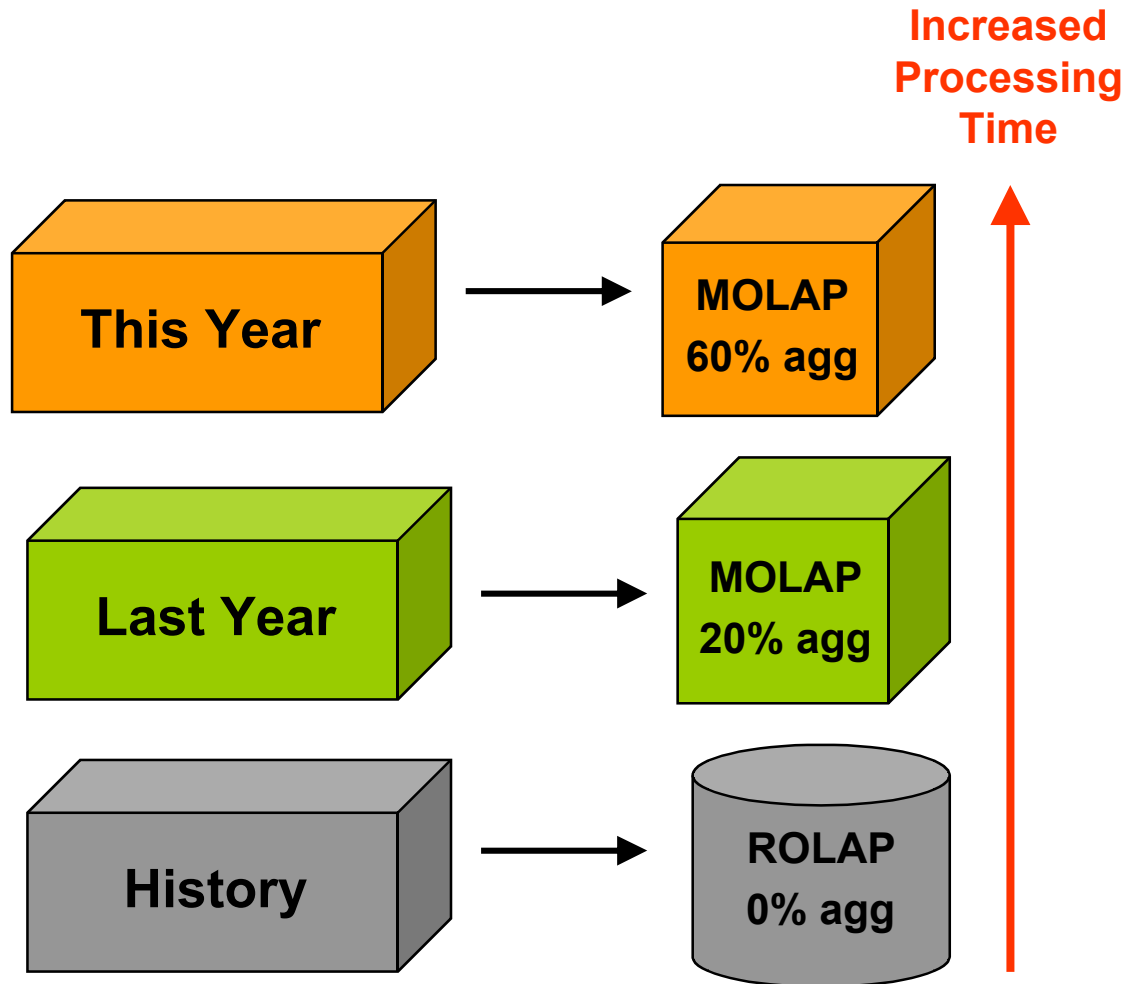
# Storage Models

MOLAP	HOLAP	ROLAP
 <p>Source Data</p> <p>Details Aggregations</p> <ul style="list-style-type: none"><li>▪ Multidimensional OLAP</li><li>▪ Best query performance</li><li>▪ Disconnected from source</li></ul>	 <p>Source Data</p> <p>Details      Aggregations</p> <ul style="list-style-type: none"><li>▪ Hybrid OLAP</li><li>▪ Query performance somewhere between MOLAP and ROLAP</li></ul>	 <p>Source Data</p> <p>Details Aggregations</p> <ul style="list-style-type: none"><li>▪ Relational OLAP</li><li>▪ (Usually) much slower query performance</li></ul>

Increasing Disk Consumption / Processing Time



Increasing query time

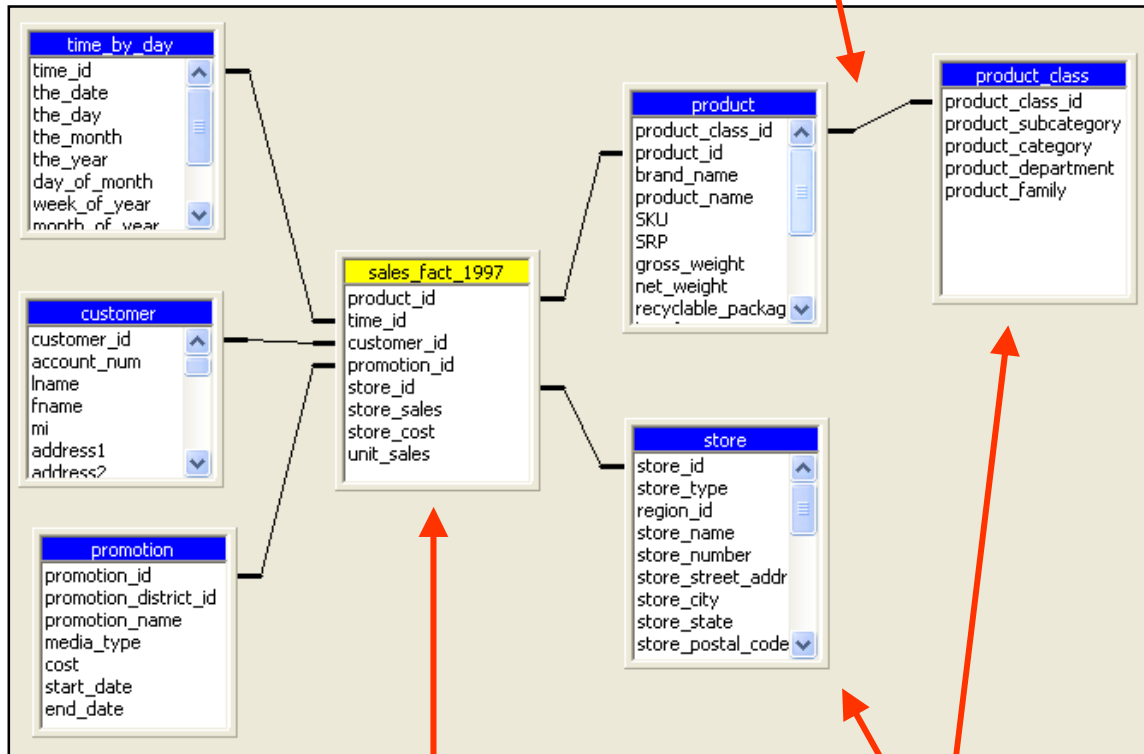


## Partitioning

- Partition Slicers
- Storage / Aggregation Model
- Physical (not logical)
- Optimisation Strategy
- Enterprise Edition only !



### Star schema with snowflaking



Fact table

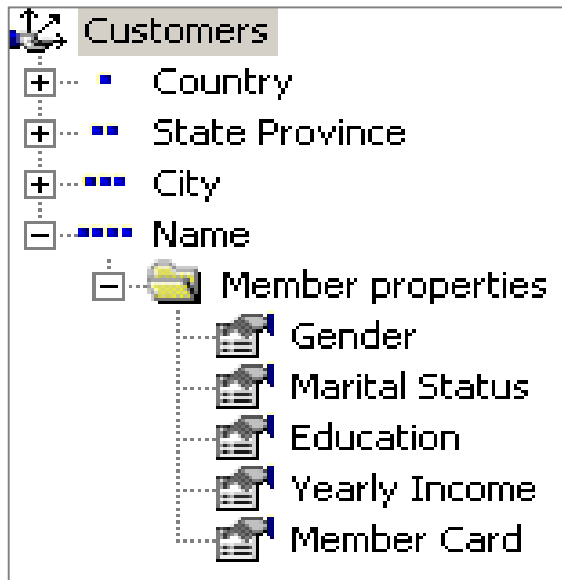
Dimension tables

## Cube Schema

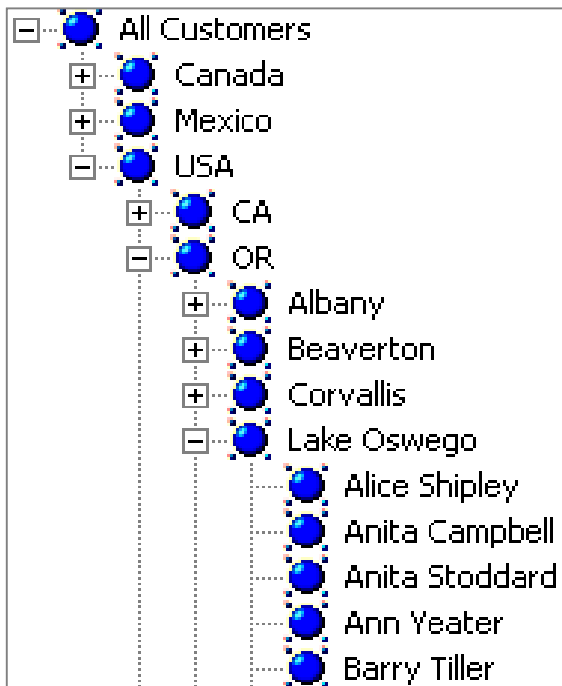
- Dimensional Modelling
- Star / Snowflake
- Fact table (measures)
- Dimension tables
- One Fact table per Cube !



**Design  
Mode**

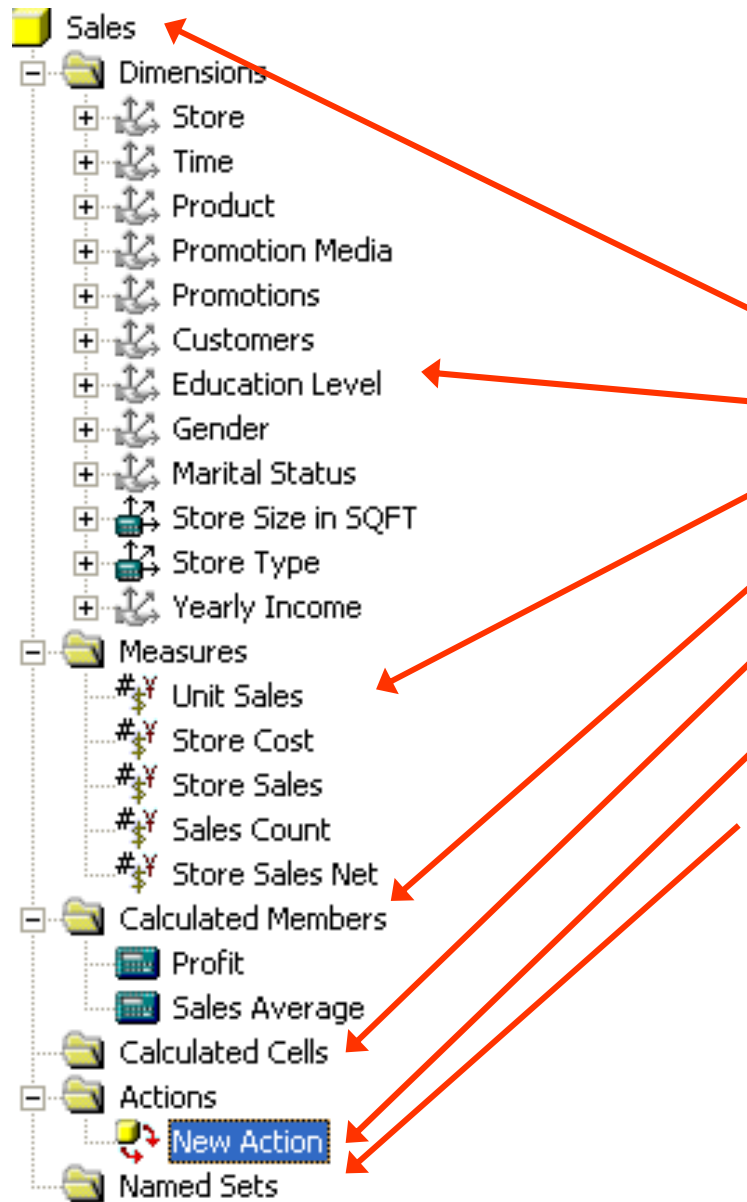


**Navigation  
Mode**



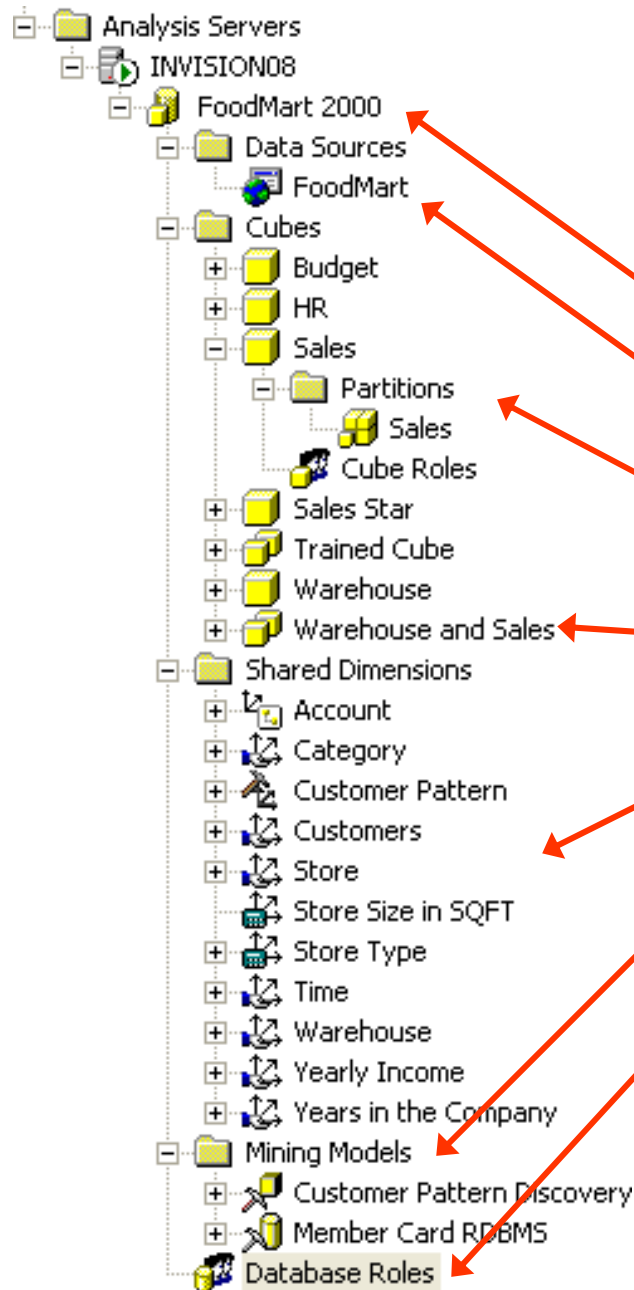
## Dimensions

- **Dimension (Shared / Private)**
- **Levels (define Hierarchy)**
- **Members**
- **Leaf Members**
- **Member Properties (Attributes)**



## Organisation of OLAP Cube

- **Cube**
- **Dimensions (private / shared)**
- **Measures (from Fact table)**
- **Calculated Members**
- **Calculated Cells**
- **Actions**
- **Named Sets**



## Organisation of OLAP Database

- OLAP Database
- Data source connection(s)
- Cubes / Partitions / Security (Roles)
- Virtual Cubes
- Shared Dimensions
- Data Mining Models
- Security – Database Roles



## MDX

- **M**ulti**D**imensional **E**xpressions
- OLAP server query language
- Interpreted by PivotTable Service
- Superficially, similar to SQL – but different !
- Example: This query returns a result set that contains the 2003 sales and tax amounts for the Southwest sales territories

```
SELECT
    { [Measures].[Sales Amount], [Measures].[Tax Amount] } ON COLUMNS,
    { [Date].[Fiscal].[Fiscal Year].&[2003] } ON ROWS
FROM
    [Adventure Works]
WHERE
    ( [Sales Territory].[Southwest] )
```



## Demonstration

- **MS SQL Server 2000 Analysis Services**
- **OLAP database development**
- **OLAP database administration**
- **Cube processing – manual / auto (DTS)**



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FoodMart - 2007 Quarterly Sales Revenue by Store

	Q1	Q2	Q3	Q4	Sum:
Bellingham	518.00	510.00	497.00	712.00	2,237.00
Beverly Hills	3,822.00	5,837.00	4,724.00	6,950.00	21,333.00
Bremerton	5,896.00				
Los Angeles	6,373.00				
Portland	6,709.00				
Salem	12,578.00				
San Diego	6,256.00				
San Francisco	439.00				
Seattle	6,098.00				
Spokane	5,607.00				
Tacoma	8,399.00				
Walla Walla	500.00				
Yakima	3,096.00				
<b>Sum:</b>	<b>66,291.00</b>				

OLAP Panel (INVISION01 / FoodMart 2000 / Sales)

Double-click or drag/drop a dimension button.

Customers	Education Level	Gender
Marital Status	Product	Promotion Media
Promotions	Store Size in SQFT	Store Type

Store: Members on level Store ...  
Time: Members on level Year,  
Measures

Drop dimensions here

Clear Options Save and Close OK Cancel Help

Welcome bomanager

BUSINESS OBJECTS

### WebIntelligence OLAP Report Panel

Save Send

Query Panel

- Customers
  - Children of All Customers
  - USA
- Education Level
  - Children of All Education Level
- Gender
- Marital Status
- Measures
  - Default: Unit Sales
- Product
- Promotion Media
- Promotions
- Store
- Store Size in SQFT
- Store Type
- Time
  - Members on level Quarter
  - Yearly Income

### OLAP Report

Time	Q1	Q2	Q3	Q4
Customers				
USA	66,291.00	62,610.00	65,848.00	72,024.00
CA	16,890.00	18,052.00	18,370.00	21,436.00
OR	19,287.00	15,079.00	16,940.00	16,353.00
WA	30,114.00	29,479.00	30,538.00	34,235.00

Time

- Q1
- Q2
- Q3
- Q4

## Client Tools

- Thin client: WebIntelligence for OLAP (\*.owr files)
- Full client: OLAP Connect, BusinessObjects Add-In (\*.rep files)
  - Data Provider settings in olapconnect.ini
- Full client: BusinessQuery MD (MS Excel Add-In)

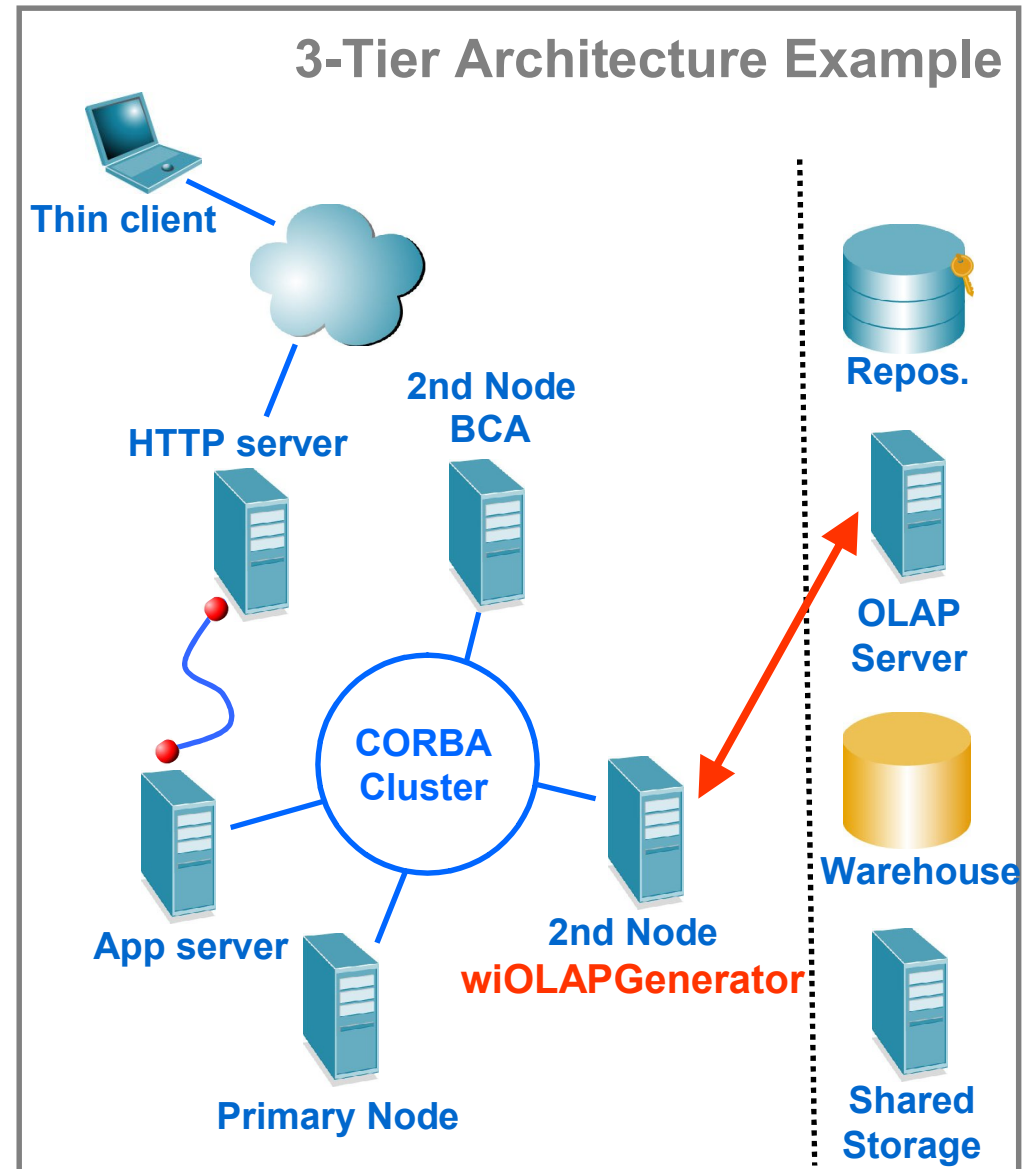


## Server Components

- OLAP Access Pack
- wiOLAPGenerator Process
  - Windows only
  - runs on any node
  - <= 1 per node
  - >= 1 per cluster
- OLAP Cache Service (Members)
- Universal Drill Through Service (UDS)
  - Drill through OLAP to Webi Report
  - Uses XML content maps (\*.udm)

## Server Configuration

- General / Cache / UDS
  - olapreg.ini
- Pivot Table Service (PTS) properties
  - olaptuning.ini
- Look and Feel
  - webiolap\_<language>.css





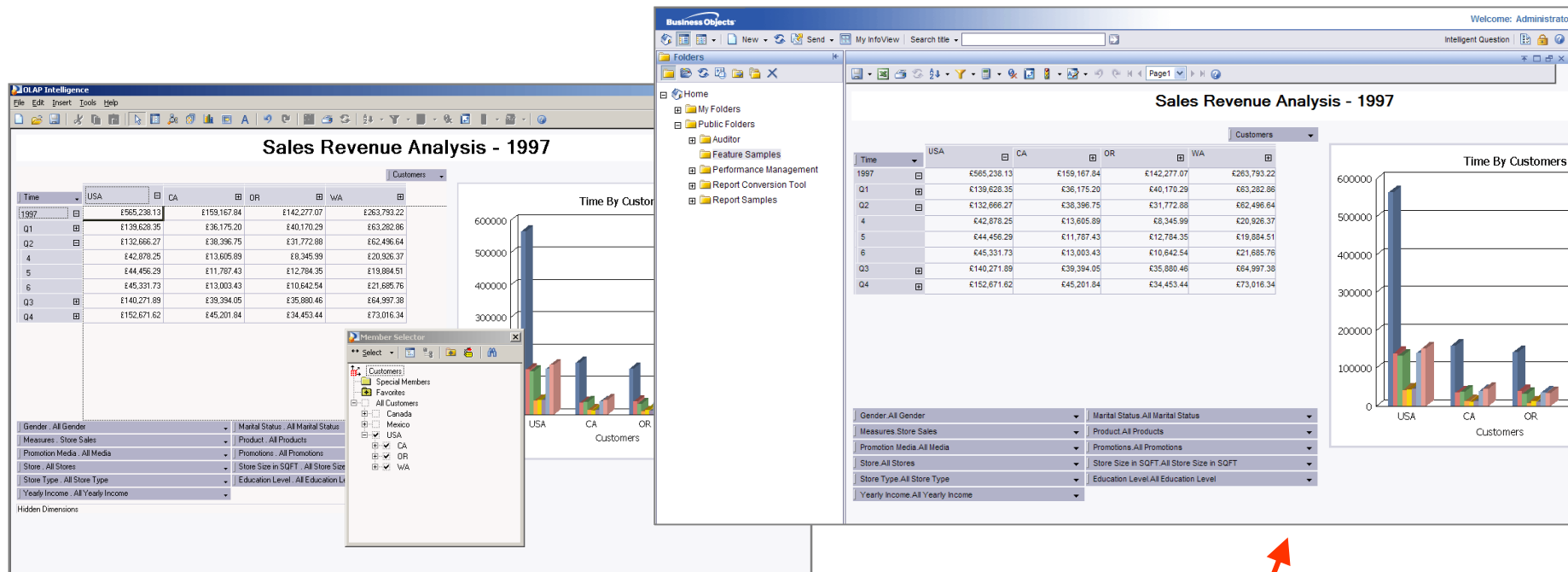
## Demonstration

- **Analysis with BusinessObjects 6.5**
- **Using BusinessObjects OLAP Connect**
- **Using WebIntelligence for OLAP**



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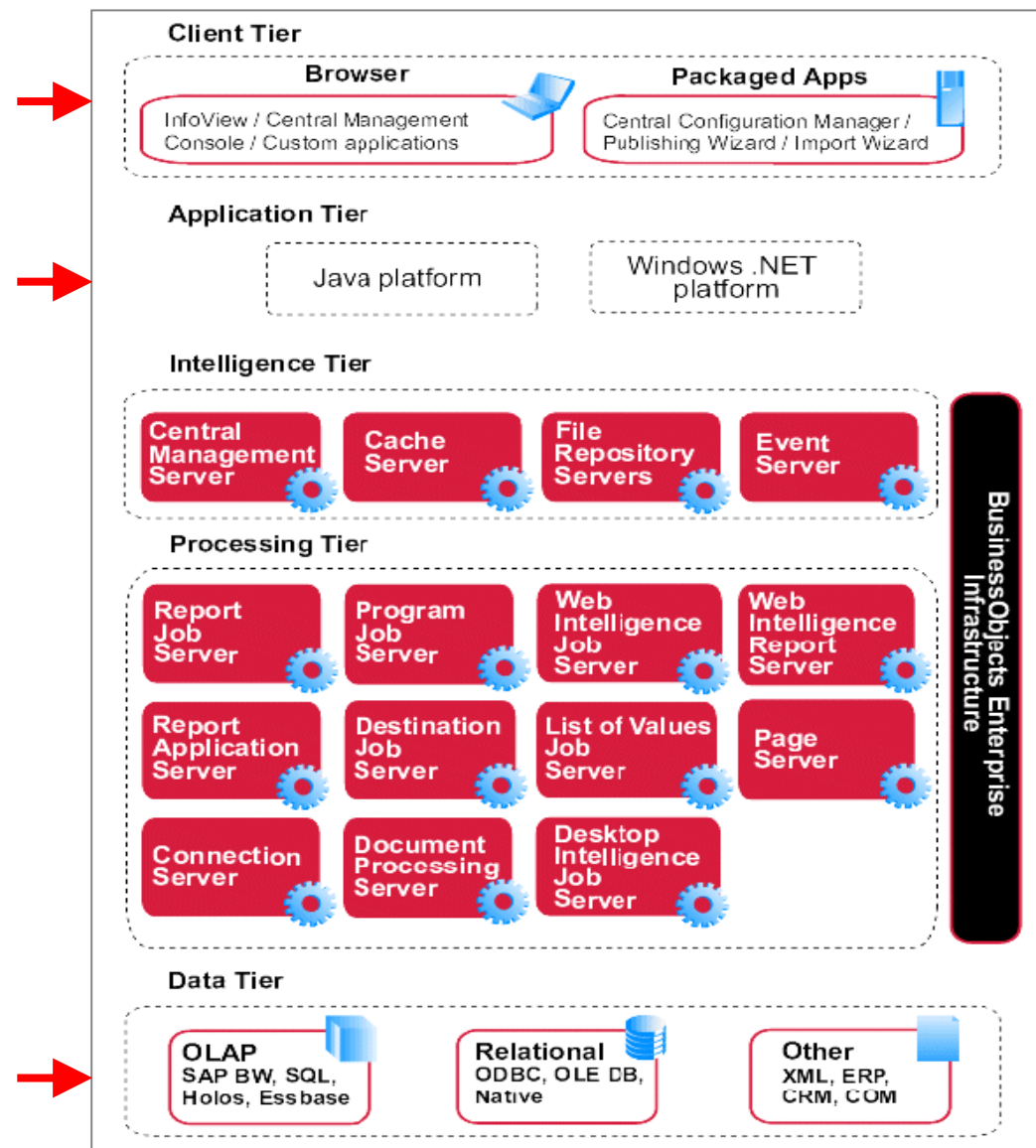
## Client Tools

- Full client: OLAP Intelligence (\*.car files)
- Full client: Crystal Reports (\*.rpt files)
- Thin client: OLAP Intelligence Web Viewer
- Reporting via universe based upon OLAP data provider



## Server-side

- Application Server handles OLAP Intelligence DHTML viewer calls
- With the ActiveX viewer, calls are handled by the ActiveX control on the client





## Demonstration

- **Analysis with BusinessObjects Xlr2**
- **Using OLAP Intelligence**
- **Using OLAP Intelligence Web Viewer**



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# Questions ?

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