

Oracle Analytics & EPM Sources

Best Friends Forever



45 minutes to end the day with ...

- EPM (ex Hyperion)
- OBIEE (ex Siebel)

- Supposed to meet in 11.1.1.7
 - connectors added little by little

- EPM sources in OBIEE
 - Essbase: OBIEE 10g “paper” support, better in 11g
 - Planning: OBIEE 11.1.1.9 connect via ADM driver
 - HFM: OBIEE 11g connector via ADM driver

The "Swiss BA Team"

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- Managing Director of DATAlysis GmbH (Switzerland)
- Working with BI and EPM tools for about 10 years
- Oracle ACE ♠️
- Part-time blogger on gianniceresa.com
- Full-time IRC (freenode | #obihackers) resident
 - Same group on Telegram
 - <http://telegram.me/obihackers>
- ODC (ex OTN) forums addict
- Technology geek (or just geek in general)

Christian Berg

- Owner of Dimensionality GmbH (Switzerland)
- Hacking OBI since 2001 (nQuire + Peregrin acquisitions by Siebel)
- Oracle ACE ♠️
- Part-time blogger on Oracle BI dimensionality.ch
- Full-time IRC (freenode | #obihackers) resident
 - Same group on Telegram
 - <http://telegram.me/obihackers>
- Oracle BI trainer for Oracle University since 2006
- Proud geek and gamer
- Responding to any and all questions 24/7 (especially on IRC)

EPM meet BI: Reality or Fake news?

BI / EPM
Apps

Planning & Forecasting
Financial Close & Reporting

Strategy Management
Profitability Management

ERP Analytics

CRM Analytics

Industry Analytics

BI/EPM
Platform

Query & Analysis Interactive Dashboards Scorecards Reporting & Publishing Office Search Detect & Alert Embedded Mobile

Common Enterprise Information Model

BI Server

Essbase

Dimension Management

Predictive Analytics

Data
Sources

OLTP & ODS Systems

Data Warehouses
Data Marts

Exadata

OLAP

Packaged Applications

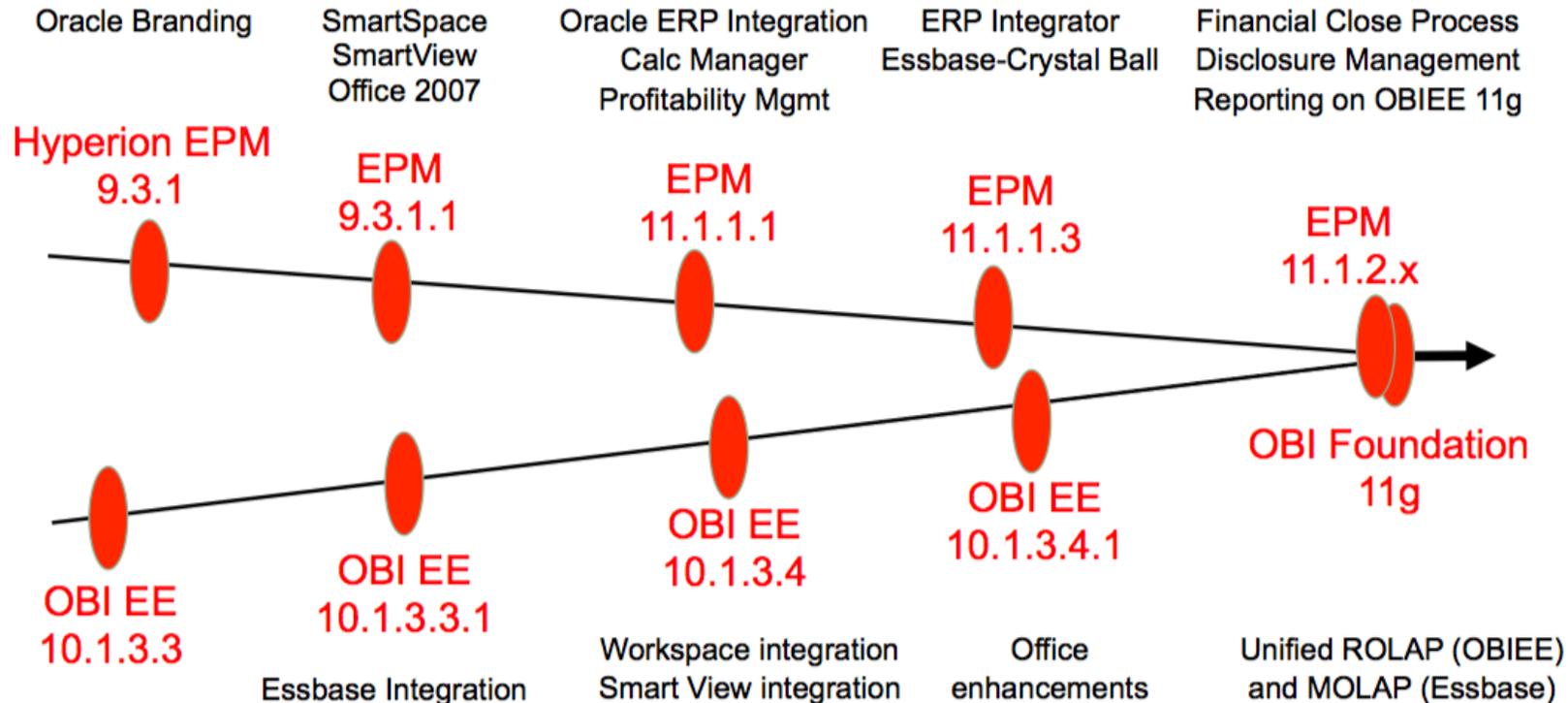
Unstructured & Semi-Structured

Excel XML/Office

Business Processes

EPM meet BI: Reality or Fake news?

Product Integration Status



ORACLE

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EPM meet BI: Reality or Fake news?

- It was ...

Name of Product: Oracle Business Intelligence Suite Enterprise Edition Plus 11.1.1.9

Last Updated: 16-Apr-2015

Oracle Business Intelligence Enterprise Edition Plus (also known as OBIEE or OBIEE+) is a suite of products that includes the following components which have an associated VPAT:

1. Business Intelligence Server Enterprise Edition
2. Interactive Dashboard
3. Office Plug-in
4. Reporting and Publishing (BI Publisher)
5. Server Administrator
6. Hyperion Interactive Reporting (Hyperion IR)
7. Hyperion SQR Production Reporting
8. Hyperion Financial Reporting (Hyperion FR)

← Hyperion is there...

This VPAT does not cover the following product areas:

- Hyperion Web Analysis
- Delivers
- Answers, but the same functionality is available via Composer.

Oracle® Fusion Middleware User's Guide for Oracle Business Intelligence Enterprise Edition has a section called Accessibility Features that describes the steps required for configuration.

- But not anymore ...

What is the current situation?

Essbase

Essbase

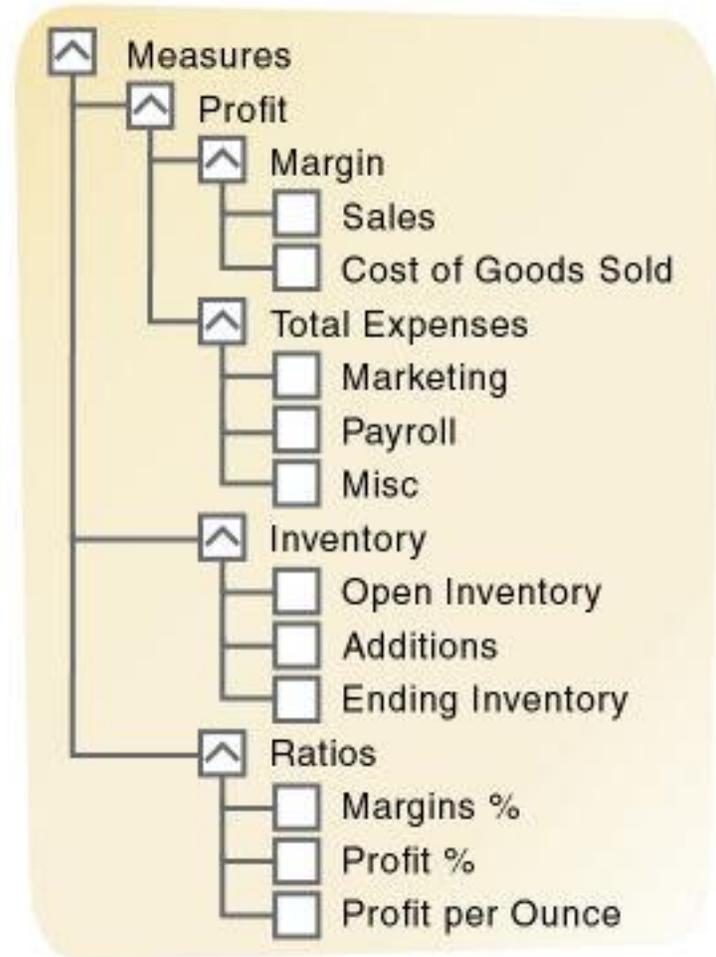
- Real multidimensional database management system
- Speaks MDX (MultiDimensional eXpressions: a query language for OLAP)
- Historically the reference for multidimensional solutions
- 2 storage engines:
 - BSO: Block storage (the original one), minimize the required space without increasing look up time. Good for running calculations across the cube as aggregate values are stored.
 - ASO: Aggregate storage (added in Essbase 7), doesn't store aggregate values but calculate them on the fly on-demand.
- Ahead of time:
 - EPM on-prem only has Essbase 11g
 - OBIEE 12c comes on-prem with an embedded Essbase 12c
 - Cloud also has Essbase 12c family version

+	ACTUAL 2015									BUDGET	VARIANCE	COMMENTS
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	SEP 2015		
+ Net Sales	20,837	17,097	20,265	20,837	21,366	21,900	28,471	26,132	33,380	30,194	11	
+ Cost of Goods Sold	12,639	11,669	12,344	12,639	14,920	13,360	17,324	18,390	20,461	19,654	4	
Gross Margin	8,199	5,428	7,921	8,199	6,446	8,541	11,147	7,742	12,919	10,540	23	explain > 20%
Total Compensation	2,475	2,064	1,979	2,475	2,064	1,979	2,475	2,064	1,979	2,343	-16	explain < -10%
Professional Services	310	284	248	310	284	248	310	284	248	301	-18	explain < -10%
Travel& Entertainment	449	358	361	449	358	361	449	358	361	411	-12	explain < -10%
Administrative	798	687	666	798	687	666	798	687	666	838	-21	explain < -10%
Direct Costs	4,032	3,393	3,254	4,032	3,393	3,254	4,032	3,393	3,254	3,892	-16	explain < -10%
Total Depreciation	218	161	225	218	161	225	218	161	225	245	-8	
Amortization Expense	686	477	742	686	477	742	686	477	742	631	18	
Operating Expenses	4,936	4,032	4,221	4,936	4,032	4,221	4,936	4,032	4,221	4,768	-11	explain < -10%
Operating Income	3,263	1,396	3,700	3,263	2,414	4,320	6,211	3,710	8,698	5,772	51	explain > 20%
Interest Income (Expense)	216	215	228	249	283	365	310	448	561	510	10	
Income Before Taxes	3,479	1,611	3,928	3,512	2,698	4,684	6,521	4,158	9,259	6,282	47	explain > 20%
Taxes	696	322	786	702	540	937	1,304	832	1,852	1,256	47	explain > 20%
Net Profit	2,783	1,289	3,143	2,810	2,158	3,748	5,217	3,326	7,407	5,026	47	explain > 20%

Essbase

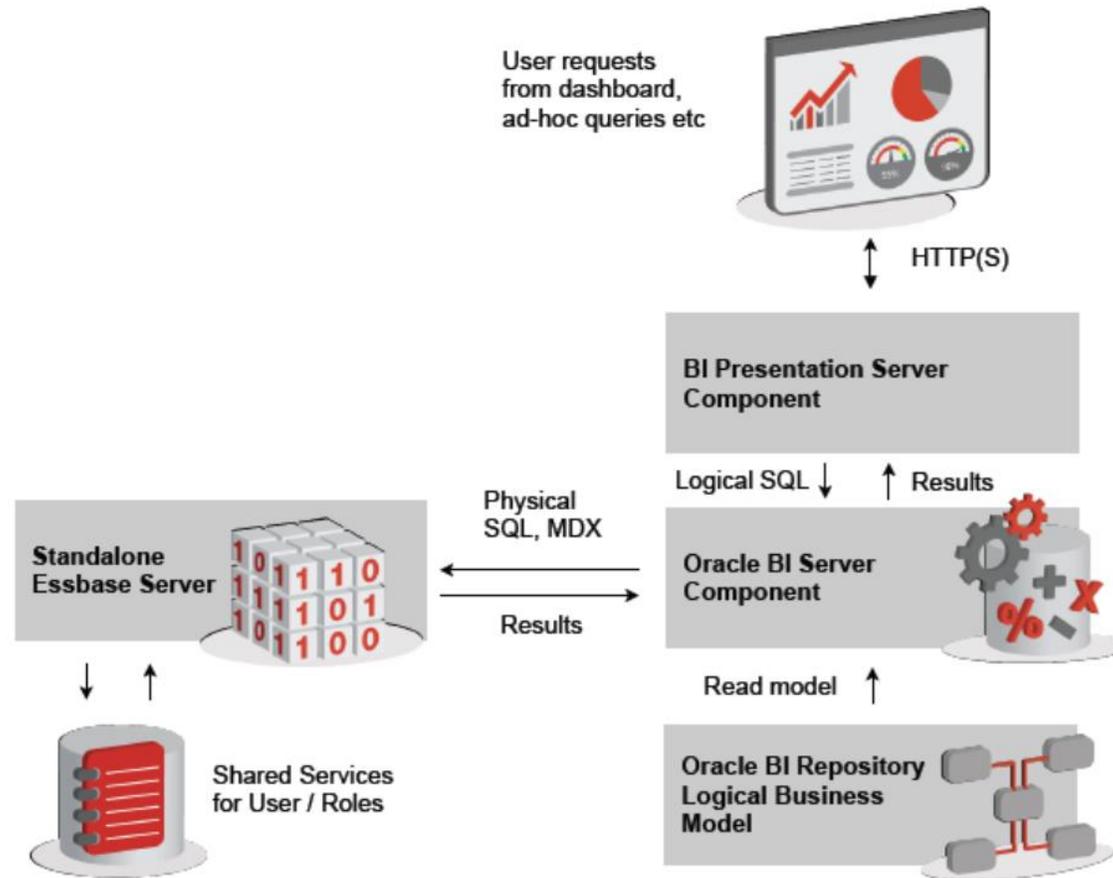
- THE key feature
- Non-linear aggregation
- Hierarchical measure navigation

Generation 1, Level *
Generation 2, Level 2
Generation 3, Level 1
Generation 4, Level 0
Generation 4, Level 0
Generation 3, Level 1
Generation 4, Level 0
Generation 4, Level 0
Generation 4, Level 0
Generation 2, Level 1
Generation 3, Level 0
Generation 3, Level 0
Generation 3, Level 0
Generation 2, Level 1
Generation 3, Level 0
Generation 3, Level 0
Generation 3, Level 0

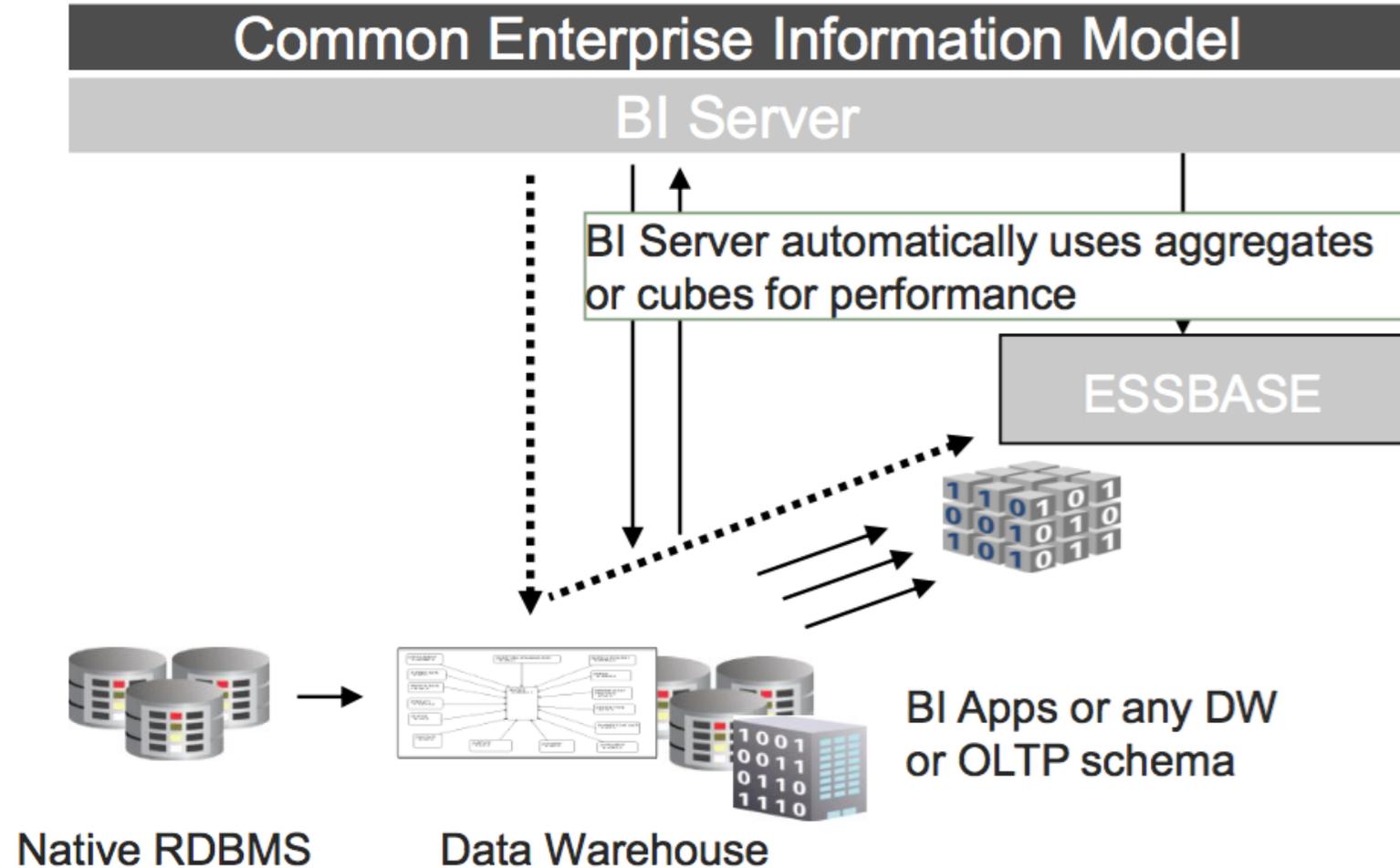


* The level of Measures depends on the branch

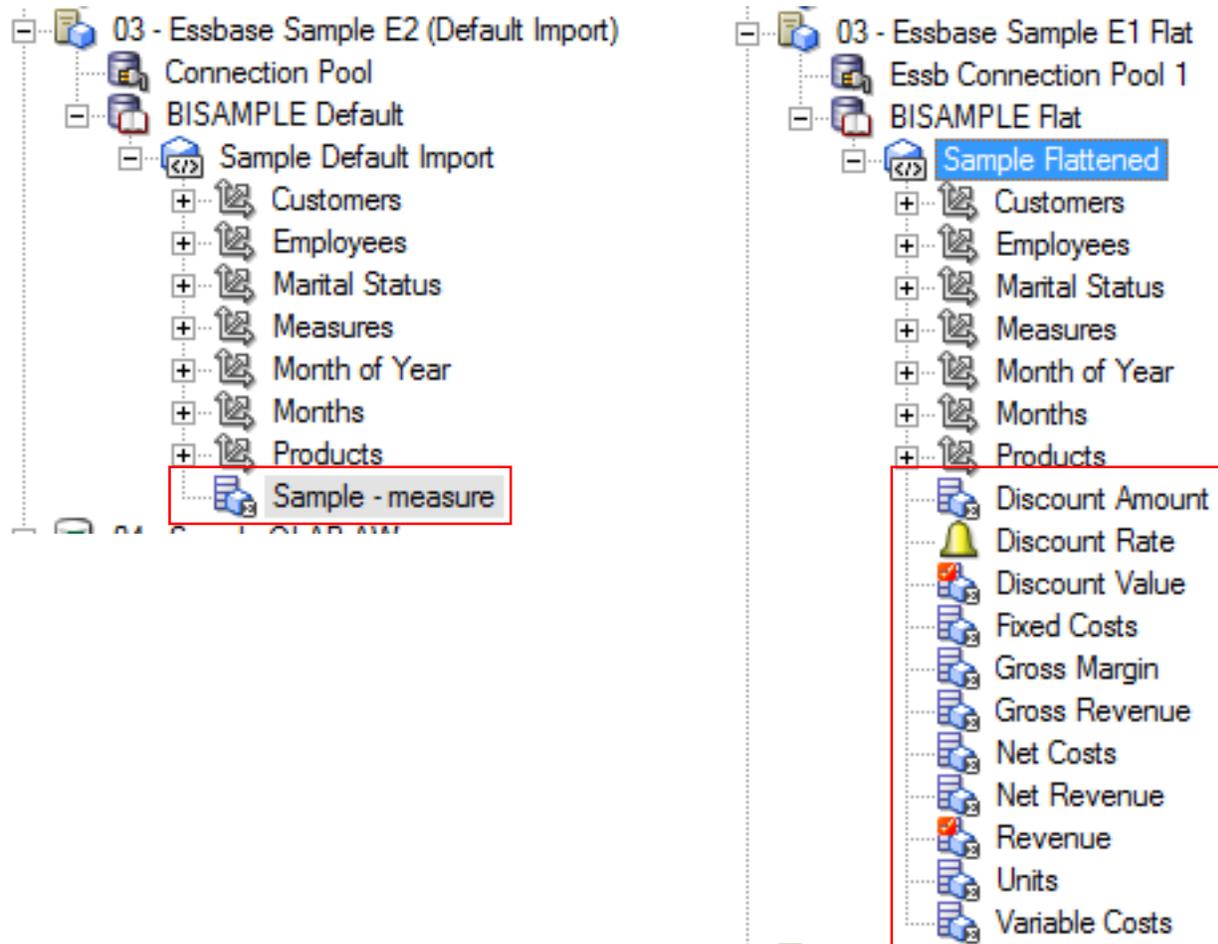
Connecting OBIEE to Essbase



Something security



Measure hierarchies vs flattened measures



Measure hierarchies vs flattened measures

Selected Columns	
Time	Measures Hierarchy
▶ Time Hierarchy ⚙	▶ M1 Measures Hier ⚙
	▶ Generic measure ⚙

Selected Columns			
Year	Basic		
▶ Year ⚙	▶ Profit ⚙	▶ Margin ⚙	▶ Sales ⚙

Measure columns

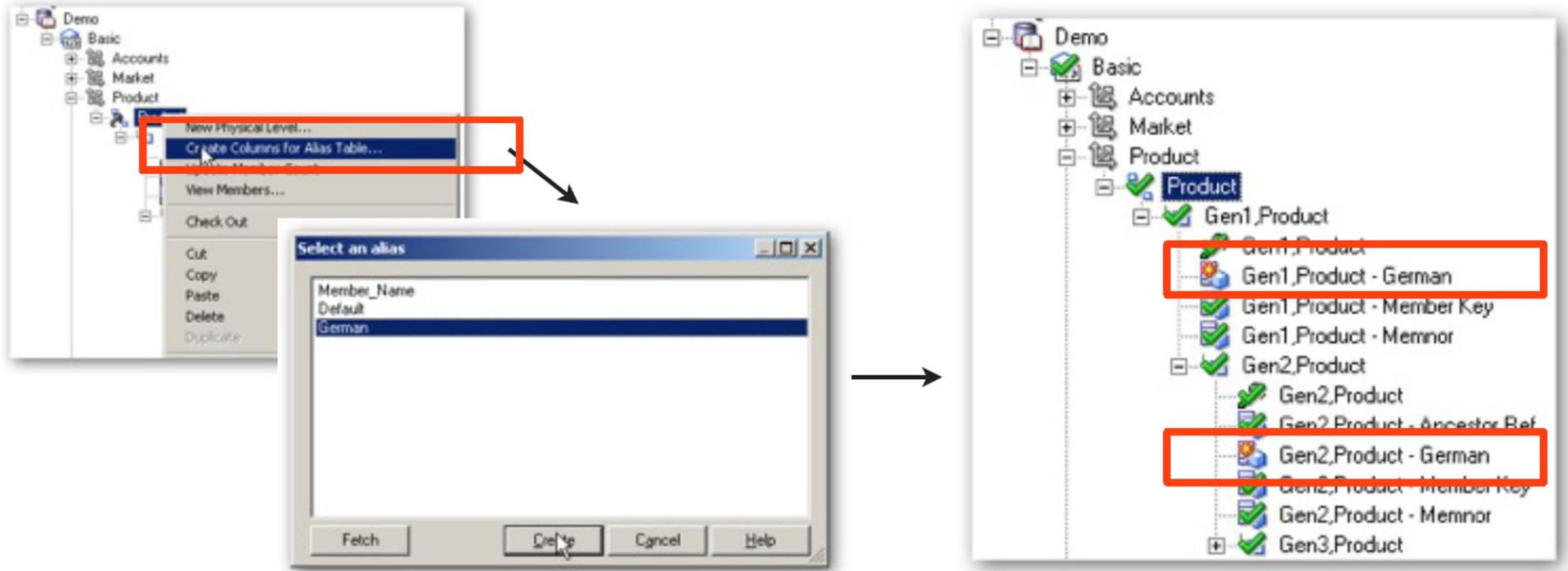
NO measure hierarchy!

Measure hierarchies vs flattened measures

	► Calendar
M1 Measures Hier	Generic measure
▲ Measures	1,902,092
▲ Gross Margin	1,902,092
▲ Net Revenue	64,402,092
Gross Revenue	70,000,000
Discount Amount	5,597,908
Units	5,657,221
▲ Net Costs	62,500,000
Fixed Costs	26,500,000
Variable Costs	36,000,000

Year	Profit	Margin	Sales
▲ Year	2,948,371	6,182,619	11,182,894
► Qtr1	694,963	1,482,355	2,677,859
► Qtr2	755,802	1,570,240	2,835,030
► Qtr3	778,247	1,613,597	2,933,622
► Qtr4	719,360	1,516,427	2,736,383

Aliases



Essbase status?

- All in all nicely integrated
- OBIEE generate MDX, can use UDAs, aliases, flat measures or hierarchy
- OBIEE can read variables from Essbase
- Few queries aren't as fast as "by hand" MDX as there is control on some details like "Missing Suppressing"

Oracle (Hyperion) Planning

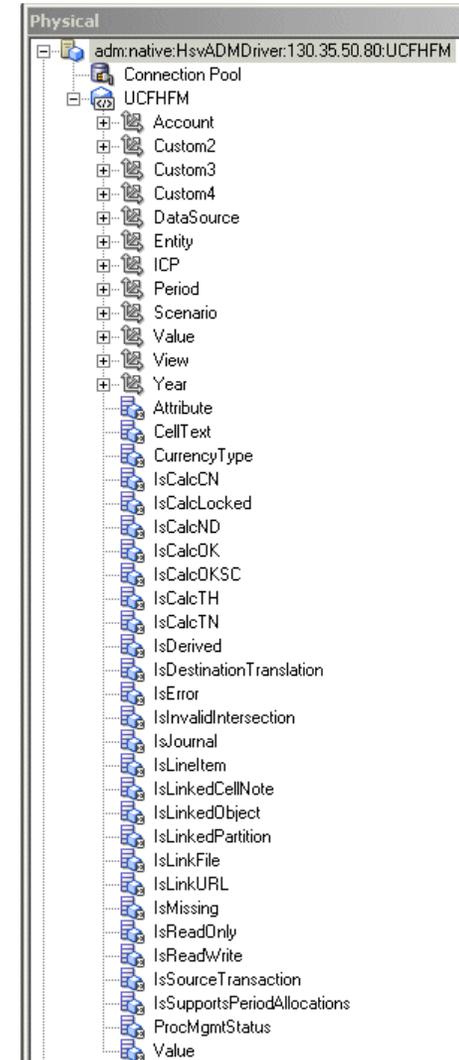
Hyperion Planning finally supported

- May 14, 2015 : **OBIEE 11.1.1.9 is GA**
- One of the new features:
 - Access to Hyperion Planning Data Sources

Access to Hyperion Planning Data Sources

Oracle BI EE now supports Hyperion Planning as a data source.

- What? How? Where?
 - Via an ADM “driver”
 - Not lot of details in the documentation, better to try it by myself



But first, what is the challenge with Planning?

- For most of the people Hyperion Planning is Essbase
 - Essbase store numeric figures
 - For reporting it's often enough
- But there is more
 - Each Planning app has a relational database
 - Contains a copy of the Essbase outline
 - Cells attributes
 - Special features of the UI and forms

The screenshot shows a web-based configuration interface for a data source. The title bar reads 'Data Source' and the subtitle is 'Edit Data Source : SAMPLEAPP'. The 'Data Source Description' field contains 'Planning VISION SampleApp'. Below this, there are two main sections: 'Application Database' and 'Essbase Server'. The 'Application Database' section includes fields for Database (Oracle), Server (oel6), Port (0), Service Name or SID (pdbord.localdomain), User (EPM_SAMPLEAPP), Password (masked with dots), and a checked 'Custom' checkbox. The 'Essbase Server' section includes fields for Server (oel6), User (admin), Password (masked with dots), and a 'Unicode' checkbox. A 'Validate' button is located at the bottom right of the form. The 'Connection URL' field at the bottom shows 'jdbc:oracle:thin:@oel6:1521/pdbord.localdo main'.

- For “operational” reporting on Planning these information are important

A reminder: what is Hyperion Planning?

“Enterprise Wide Planning, Budgeting and Forecasting”

“Oracle Hyperion Planning is a centralized, Microsoft Office and Web-based planning, budgeting and forecasting solution that integrates financial and operational planning processes and improves business predictability.”

(source: oracle.com)

A reminder: what is Hyperion Planning?

Hyperion Planning interface showing a Revenue Forecast - Products form. The interface includes a menu bar, a toolbar, and a search bar. The main area displays a data table for the forecast.

Scenario: Forecast **Version:** Working **ProductFamily:** P_TP1:Computer Equipment

410 : International Sales

		FY13				FY13				Jan
		Jul	Aug	Sep	Q3	Oct	Nov	Dec	Q4	
P_100:Product X	Units	212	206	241	659	188	177	210	575	
	ASP	619	619	618	619	619	620	619	619	
	Gross Margin %	29%	29%	29%	29%	29%	29%	29%	29%	
	4001: Total Revenue	131,186	127,460	148,979	407,625	116,287	109,666	129,944	355,897	
	5000: Total Cost of Sales and Service	93,280	90,640	106,040	289,960	82,720	77,880	92,400	253,000	
	▲ Gross Profit	37,906	36,820	42,939	117,665	33,567	31,786	37,544	102,897	
P_110:Sentinal Standard Notebook	Units	291	320	328	939	276	254	276	806	
	ASP	441	442	442	442	442	443	442	442	
	Gross Margin %	31%	31%	31%	31%	31%	31%	31%	31%	
	4001: Total Revenue	128,471	141,331	144,989	414,791	122,044	112,413	122,044	356,502	
	5000: Total Cost of Sales and Service	89,046	97,920	100,368	287,334	84,456	77,724	84,456	246,636	
	▲ Gross Profit	39,425	43,411	44,621	127,457	37,588	34,689	37,588	109,866	
P_120:Sentinal Custom Notebook	Units	167	188	154	509	177	167	200	544	
	ASP	735	735	732	734	733	735	733	734	
	Gross Margin %	30%	30%	30%	30%	30%	30%	30%	30%	
	4001: Total Revenue	122,705	138,169	112,728	373,602	129,688	122,705	146,648	399,041	
	5000: Total Cost of Sales and Service	86,005	96,820	79,310	262,135	91,155	86,005	103,000	280,160	
	▲ Gross Profit	36,700	41,349	33,418	111,467	38,533	36,700	43,648	118,881	
P_130:Envoy Standard Netbook	Units	584	654	527	1,765	439	512	509	1,460	
	ASP	231	231	231	231	231	231	231	231	
	Gross Margin %	29%	28%	28%	28.33%	29%	28%	28%	28.33%	
	4001: Total Revenue	134,857	150,917	121,574	407,348	101,317	118,083	117,386	336,785	

A reminder: what is Hyperion Planning?

HomePage Vision - Plan Types x

Forms
Manage Task Lists
My Task List
Dimension

Plan Types

Actions View + Detach

Plan Type Name	Cube Type	Cube Name	Essbase Application
Plan1	BSO	Plan1	Vision
Plan2	BSO	Plan2	Vision
Plan3	BSO	Plan3	Vision

HomePage Vision - Alias Tables x

Forms
Manage Task Lists
My Task List
Dimension

Alias Tables

Actions View + Detach

Alias Table
Default
English

HomePage Vision - Dimensions x

Forms
Manage Task Lists
My Task List
Dimension

Dimensions Performance Settings Evaluation Order

Plan Type Plan1 Dimension Product + Sort Descendants

Actions View + Detach

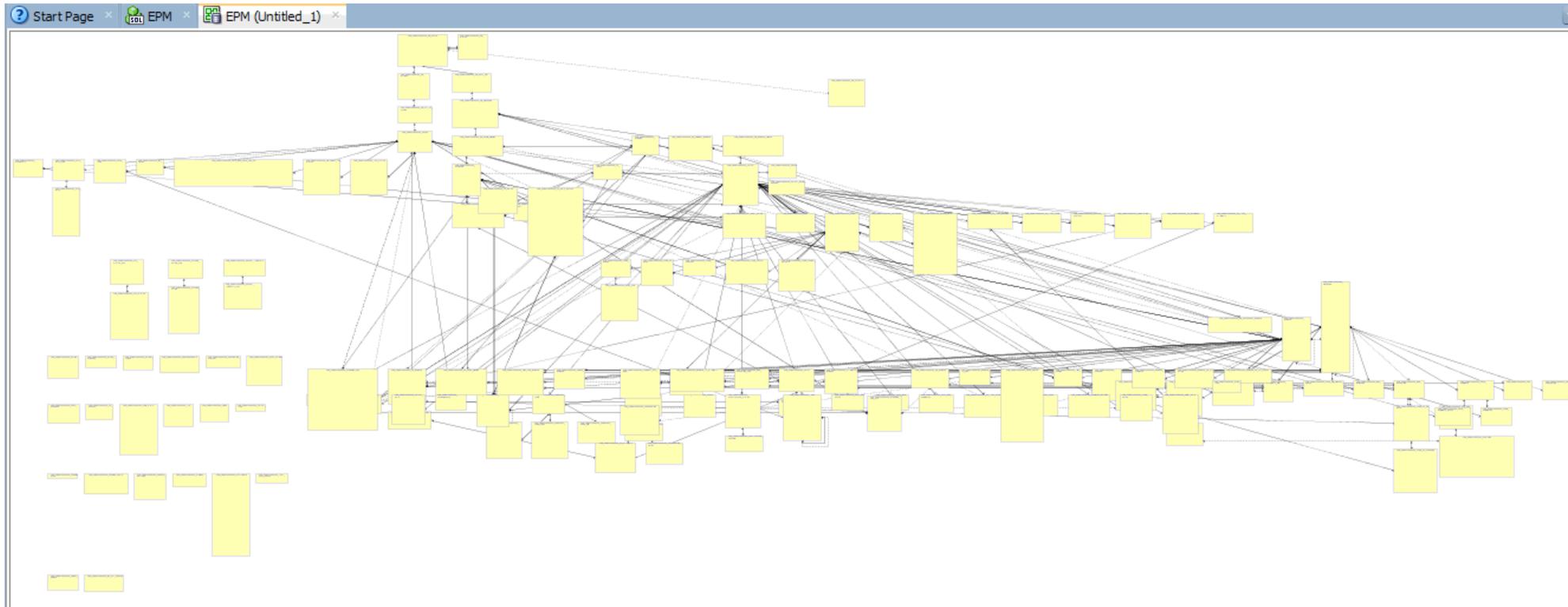
Name	Alias (Default)	Data Storage
Product		Never Share
P_TP	Total Product	Never Share
P_000	No Product	Store
P_TP1	Computer Equipment	Never Share
P_100	Product X	Store
P_110	Sentinel Standard Notebook	Store
P_120	Sentinel Custom Notebook	Store
P_130	Envoy Standard Netbook	Store
P_140	Envoy Custom Netbook	Store
P_150	Other Computer	Store
P_160	Tablet Computer	Store
P_TP2	Computer Accessories	Never Share
P_TP3	Computer Services	Never Share

A reminder: what is Hyperion Planning?

The screenshot displays the Oracle Essbase Administration Services 11.1.2 interface. The window title is "Oracle® Essbase Administration Services 11.1.2 - admin connected on 192.168.1.44:9000". The main title bar reads "ORACLE® Essbase Administration Services". The interface includes a menu bar (File, Edit, View, Outline, Organize, Actions, Tools, Help) and a toolbar. On the left, the "Enterprise View" tree shows the hierarchy: Administration Servers > Essbase Servers > EssbaseCluster-1 > Applications > Vision > Plan1. The main area is the "Outline Editor: [EssbaseCluster-1.Vision.Plan1]". It features tabs for "Outline", "Properties", "Text List Manager", and "Modifications". The "Outline" tab is active, showing a tree structure of the plan's outline. The root is "Outline: Plan1 (Active Alias Table: Default)". Underneath, there are several nodes: "Account Accounts <5> (Never Share)", "Statistics (-) <5> (Never Share) (UDAS: Saved Assumption, Flow, HSP_NOLINK)", "AllA (+) <2> (Alias: All Accounts) (Never Share) (Expense Reporting) (UDAS: Expense, Flow, HSP_NOLINK)", "CF (-) <1> (Alias: Cash Flow) (Dynamic Calc) (UDAS: Saved Assumption, Flow)", "Cash Flow Hierarchies (-) <2> (Label Only) (TB Last) (UDAS: Saved Assumption)", "Ratios (*) <6> (Label Only) (TB Last) (UDAS: Saved Assumption)", "Period Time <8> (Active Dynamic Time Series Members: H-T-D, Q-T-D) (Never Share)", "BegBalance (-) (Alias: x-----x)", "YearTotal (+) <4> (Dynamic Calc) (Two Pass)", "YTD (-) (Dynamic Calc) [Formula: IF(@SMBR(&LastYr)) @PTD("Jan":&ThisMonth); ENDF,]", "QTD (-) (Dynamic Calc) [Formula: IF(@SMBR(&LastYr)) @PTD(@REMOVE(@CHILDREN(@MBRPARENT(&ThisMonth)), @RSIBLING ...]", "ITD (-) (Dynamic Calc) [Formula: IF(@SMBR(&LastYr)) "YTD"+@SUMRANGE("YearTotal",@CURRMBRRANGE("Year",LEV_0,- ...]", "No Period (-) (Never Share)", "Total Year (-) <12> (Never Share)", "Jan (+) (Shared Member)", "Feb (+) (Shared Member)", "Mar (+) (Shared Member)", "Apr (+) (Shared Member)", "May (+) (Shared Member)", "Jun (+) (Shared Member)", "Jul (+) (Shared Member)", "Aug (+) (Shared Member)", "Sep (+) (Shared Member)", "Oct (+) (Shared Member)", "Nov (+) (Shared Member)", "Dec (+) (Shared Member)", "Rolling (-) (Dynamic Calc) [Formula: IF (@ISUDA ("Account", "Flow")) &QRFPer1->&QRFYr1 + &QRFPer2->&QRFYr2 + &QRFPe ...]", "Year <10> (Never Share)", "Scenario <12> (Never Share)", "Version <27> (Never Share)". At the bottom right, there are buttons for "Save", "Verify", "Help", and "Close".

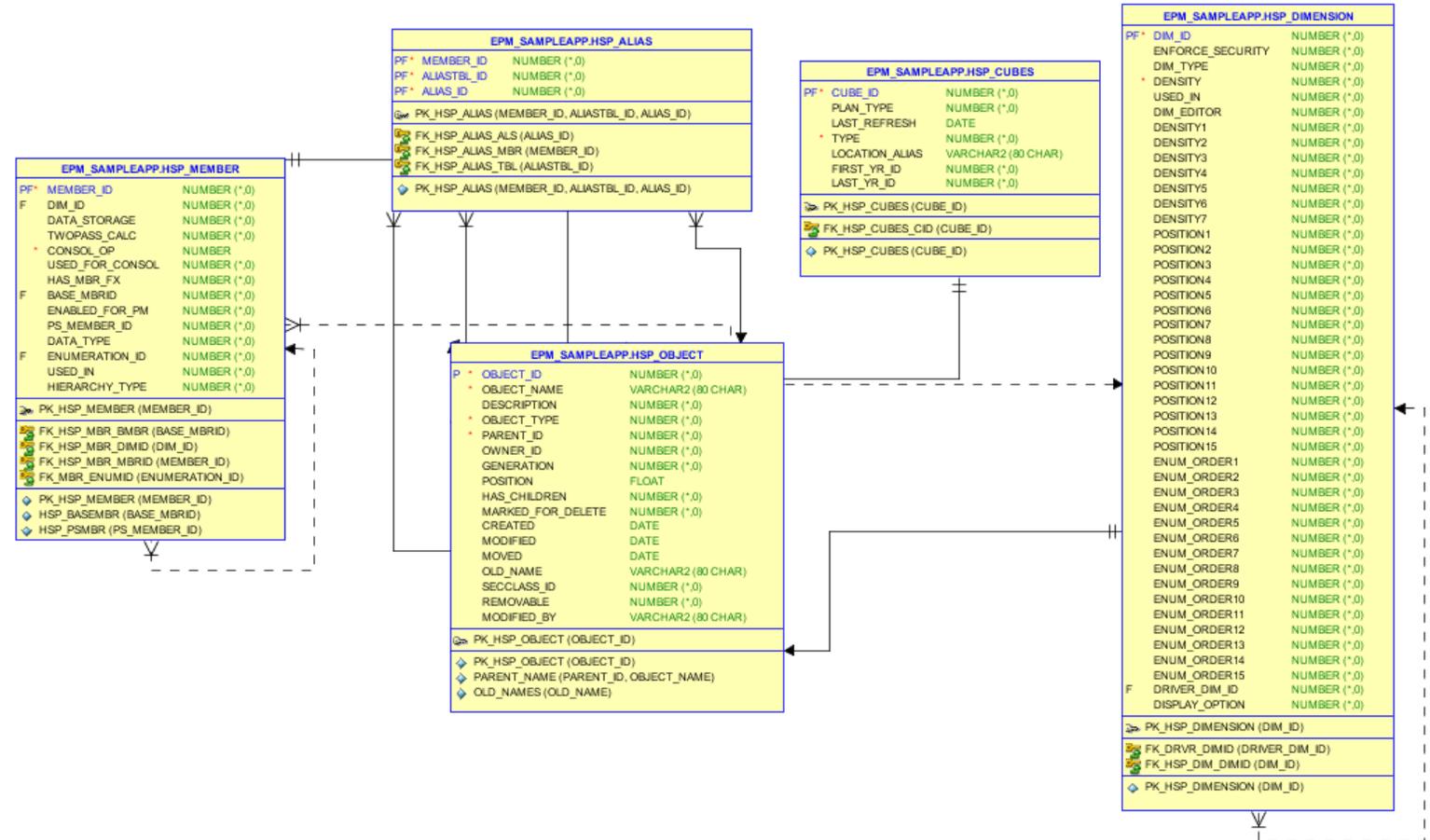
A reminder: what is Hyperion Planning?

- 1 Planning application = 1 DB schema = 142 tables (Planning 11.1.2.4)
- Transactional application schema, multiple dependencies between objects



A reminder: what is Hyperion Planning?

- The outline is stored in few tables
- HSP_OBJECT is a central object
 - parent-child structure
 - PARENT_ID = OBJECT_ID
 - members names
 - aliases
 - etc.



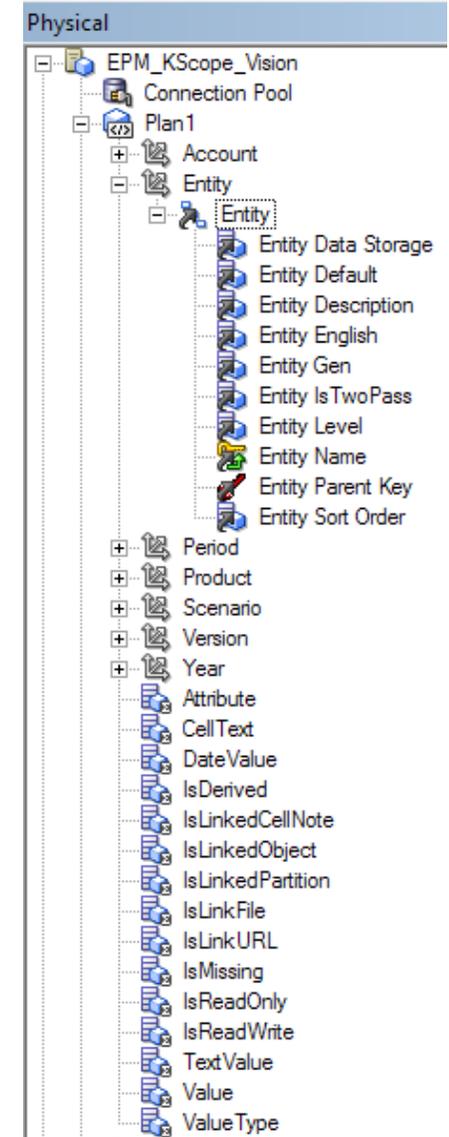
Back to OBIEE: import Metadata

- In the wizard a new type has been added for “Hyperion ADM”: Hyperion Planning
 - Only 3 fields :
 - URL (server, port and Planning application name)
 - Planning username
 - Planning password
- AdminTool NQSConfig.INI
 - require `JAVAHOST_HOSTNAME_OR_IP_ADDRESSES` setting (because the import is done server-side)

Connection Type:	Hyperion ADM
URL:	adm:thin:com.hyperion.ap.hsp.HspAdmDriver:<Server>:<Port>:<Application>
Provider Type:	Hyperion Planning
User Name:	
Password:	

How does a Planning application look like in RPD?

- Nothing really “exciting”...
- Looks like an Essbase application
- Parent-child dimensions
 - All the aliases are created
 - All the UDA are created
- A list of measure
 - A standard “Value” one
 - Lot of attributes for the measure
- Everything created by default, no real options available in the Admin Tool



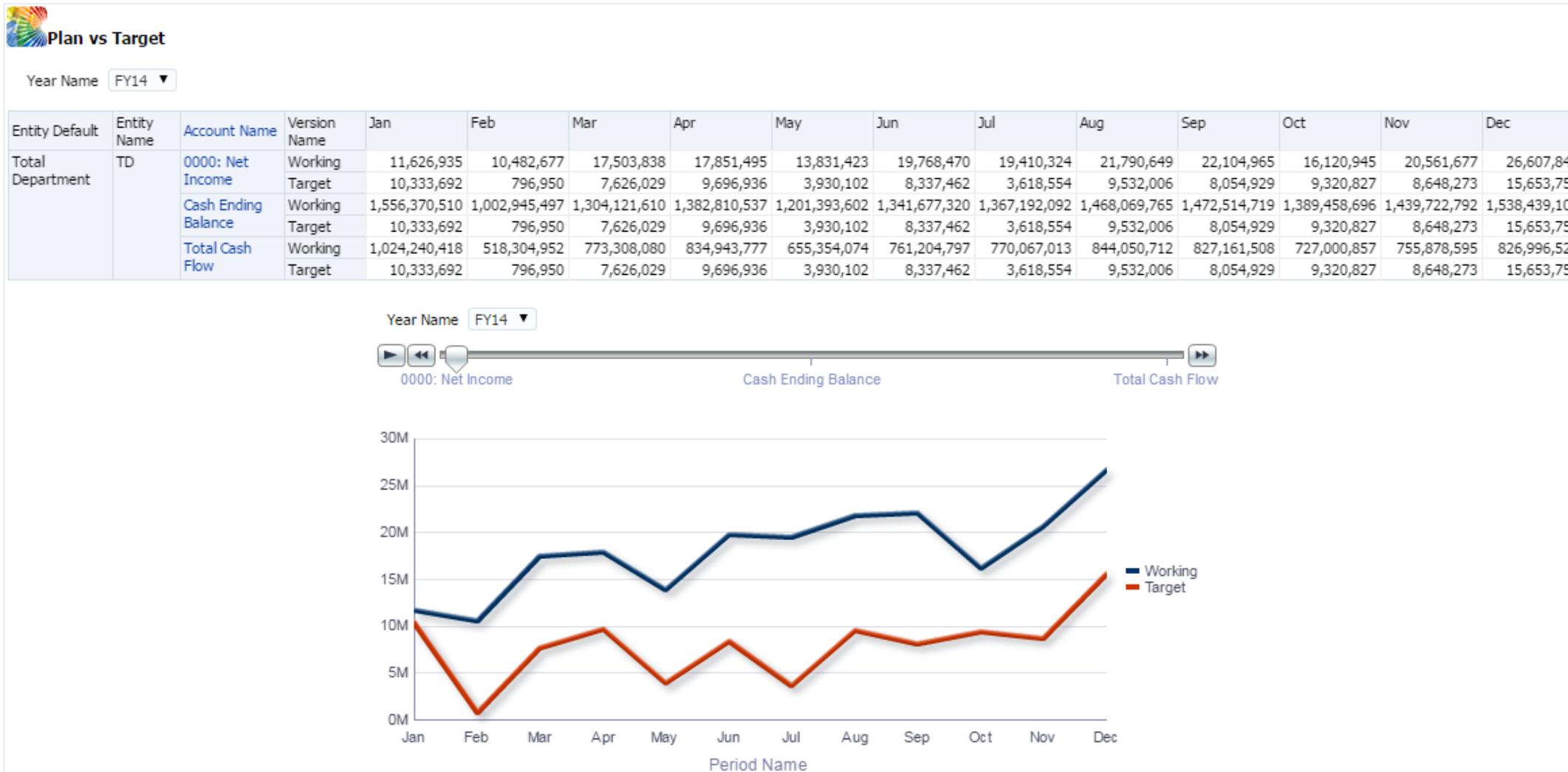
Does it work? Planning analysis sample in OBIEE

The screenshot displays the OBIEE Criteria page with the following configuration:

- Subject Areas:** Plan1 - Plan1
 - Plan1#1
 - Account
 - Period
 - Year
 - Scenario
 - Version
 - Entity
 - Product
- Selected Columns:**

Plan1#1	Account	Version	Scenario	Year	Entity	Period
Value	Account Name	Version Name	Scenario Name	Year Name	Entity Default	Period Name
- Filters:**
 - Scenario Name is equal to / is in Plan
 - AND** Version Name is equal to / is in Working; Target
 - AND Year Name is equal to / is in FY14
 - AND Account Name is equal to / is in Total Cash Flow; Cash Ending Balance; NI
 - AND Entity Default is equal to / is in Total Department
 - AND Period Level is equal to / is in 0
 - AND Period Gen is equal to / is in 4
- Catalog:** List: All
 - My Folders
 - Shared Folders

Planning analysis sample in OBIEE

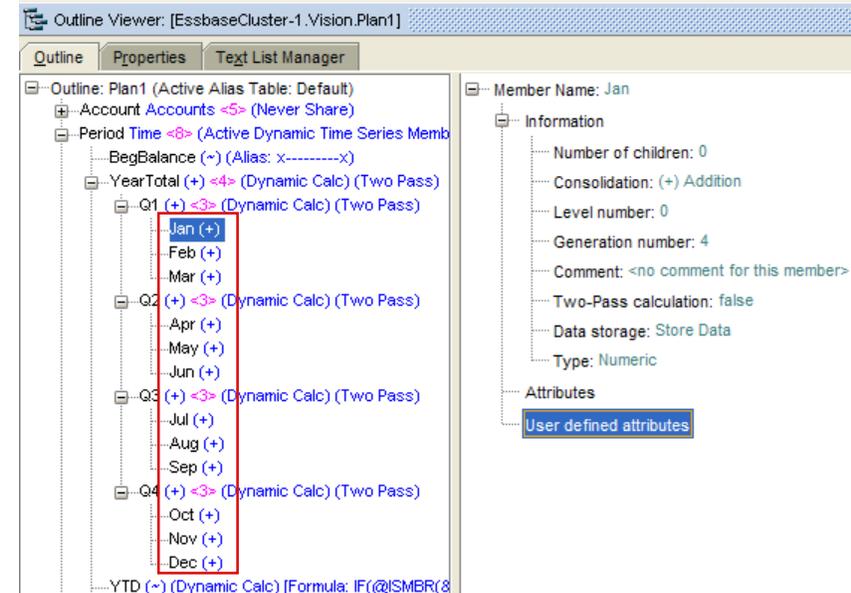


But what is this ADM driver?

- It just looks like a kind of webservice
- TCP calls
 - Admin Tool send pieces of XML via POST requests
 - ADM reply with even more XML
 - Session based
 - Login first and get a Session ID
 - Provide the Session ID in every single call
 - Logout at the end
 - Easy to read and understand XML
 - Would be easy to use the same ADM interface in custom developed applications

ADM example - Test case

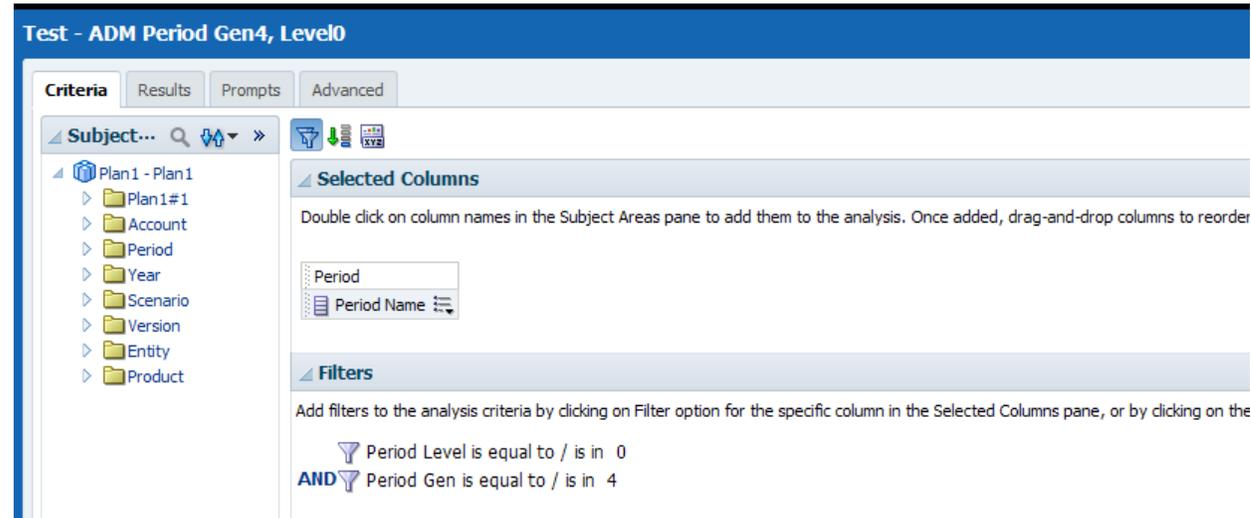
- Extremely simple example to see how the new ADM source works
 - Dimension "Period"
 - List of member names
 - Filter
 - Generation = 4
 - Level = 0



- Expected result:
 - Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

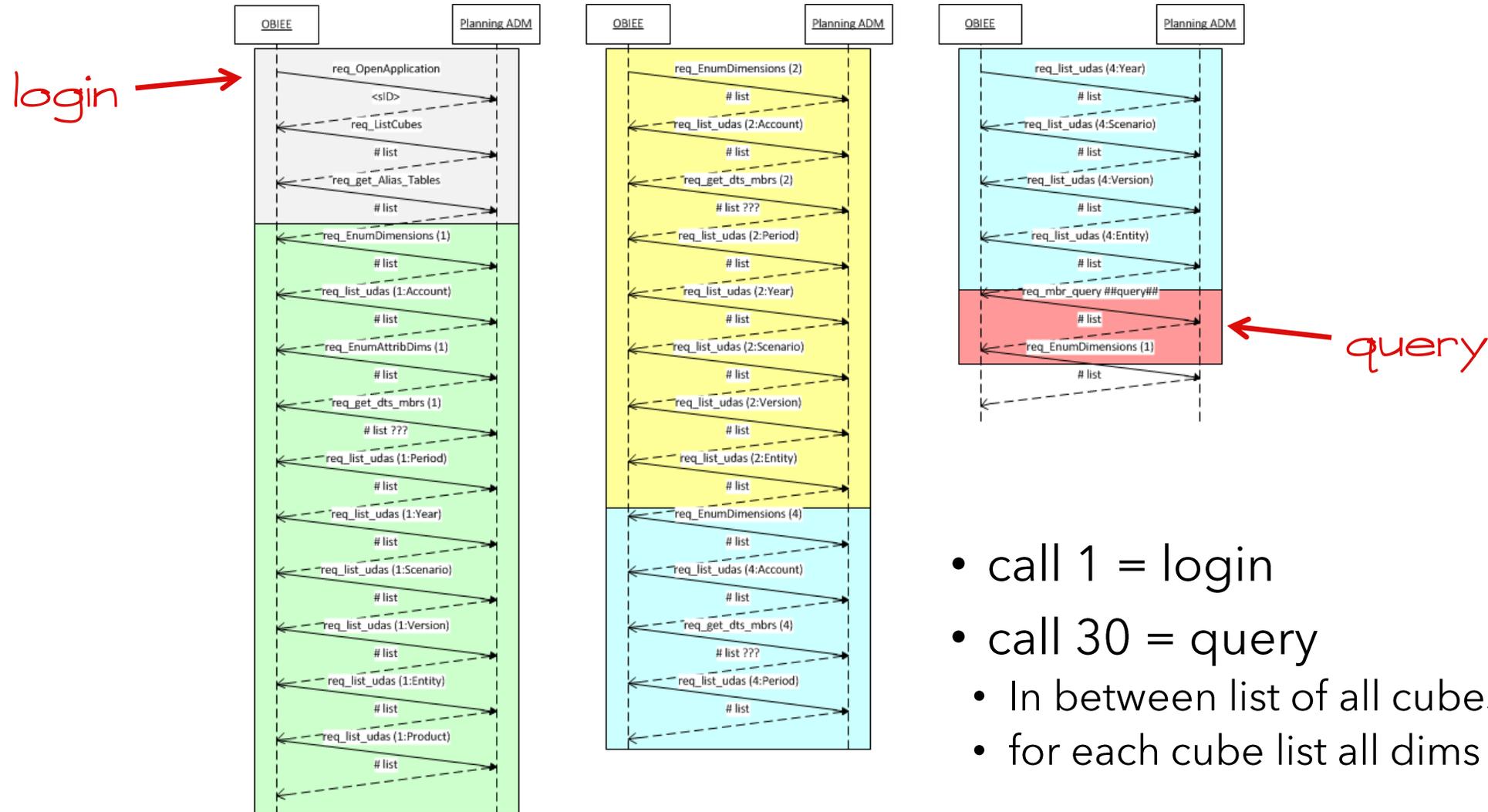
ADM example - OBIEE

- OBIEE analysis
 - Really simple!



- OBIEE cache = OFF
- To observe the communication between OBIEE and Planning 2 useful tools:
 - TCPDUMP + TCPFLOW (*tcpflow makes it easier to read*)

ADM example - TCP flow between OBIEE and Planning ADM



- call 1 = login
- call 30 = query
 - In between list of all cubes
 - for each cube list all dims and all UDAs

ADM example - How does the query looks like?

- LSQL (from the logs)

SELECT

0 s_0,

"Plan1 - Plan1"."Period"."Period Name" s_1,

SORTKEY("Plan1 - Plan1"."Period"."Period Name") s_2

FROM "Plan1 - Plan1"

WHERE

((**"Period"."Period Level" = 0**) **AND** (**"Period"."Period Gen" = 4**))

ORDER BY 1, 3 **ASC NULLS LAST**, 2 **ASC NULLS LAST**

FETCH FIRST 65001 ROWS ONLY

ADM example - How does the query looks like?

- Physical query (from the logs)

Sending query to database named EPM_KScope_Vision (id: <<90097>>),
connection pool named Connection Pool,
logical request hash 31e70a60, physical request hash 9aeb05b2: [[

Plan1:en:SELECT * FROM "Period" WHERE FilterBySecurity(), AllMembers()
]]

- Is this the real query sent via ADM?
- Where are my filters on Generation = 4 and Level = 0 ?

ADM example - How does the query looks like?

- req_mbr_query has, between other XML attributes, one named **QXML** which contains the query for ADM:

```
<?xml version="1.0" encoding="UTF-8"?>
<COMPOSITEOPERATION TYPE="MemberQuery">
  <OPERATION TYPE="Select">
    <MULTIVALUE>
      <STRING>*</STRING>
    </MULTIVALUE>
    <STRING>Period</STRING>
  </OPERATION>
  <COMPOSITEOPERATION TYPE="Filter">
    <COMPOSITEOPERATION TYPE="List">
      <OPERATION TYPE="FilterBySecurity"></OPERATION>
      <OPERATION TYPE="AllMembers"></OPERATION>
    </COMPOSITEOPERATION>
  </COMPOSITEOPERATION>
</COMPOSITEOPERATION>
```

- It really looks like the physical query logged by OBIEE (just in a XML format)
 - And the filters on Generation = 4 and Level = 0 aren't there...

ADM example - Query result

- result of the "req_mbr_query" call:

```
<?xml version="1.0" standalone="yes"?>
<res_mbr_query><slD>...</slD>
<mbrList enc="1">
<formCell cellType="10" readOnly="false" queryGeneration="1" order="0" oldName="BegBalance" mbrId="50019"
dimId="34" mbrName="BegBalance" dimName="Period" parentName="Period" layoutType="-1" locationStyle="0"
parentId="34" objectType="34" baseMbrId="0" objdefId="-1" ordinal="0.0" hasChildren="false" generation="1"
aliases="x-----x|x-----x" memberId="50019" level="0" dataStorage="0" consolOp2="5" consolOp4="5"
consolOp1="5"/>
<formCell cellType="10" readOnly="false" queryGeneration="3" order="0" oldName="Jan" mbrId="50023"
dimId="34" mbrName="Jan" dimName="Period" parentName="Q1" layoutType="-1" locationStyle="0"
parentId="50022" objectType="34" baseMbrId="0" objdefId="-1" ordinal="0.0" hasChildren="false" generation="3"
memberId="50023" level="0" dataStorage="0"/>
....
```

- All the members of the dimension are returned with some attributes, including Level and Generation
 - The filter will be done by OBIEE

Planning: Essbase vs ADM

- Essbase is a lot more integrated and native
 - proper MDX sent out, with filters etc.
- ADM is more at an application layer
 - less “data querying” properties, lot of work done on the OBIEE side
- For data analysis and reporting better to stay on a native Essbase connection
- Import in the RPD the Planning app with the ADM driver for analysis using the comments and the other extra pieces of information stored in the relational database (a guess would be 90% Essbase, 10% ADM)

Oracle Hyperion Financial Management

Oracle Hyperion Financial Management

- is a web based application that delivers global financial consolidation, reporting and analysis
- Fully stored in a relational database
- No multidimensional source involved
- Multidimensional-model-like in the application

Oracle Hyperion Financial Management

Import Metadata - Select Data Source

1 **Select Data Source**

2 Select Metadata Types

3 Select Metadata Objects

4 Map to Logical Model

5 Publish to Warehouse

Connection Type:

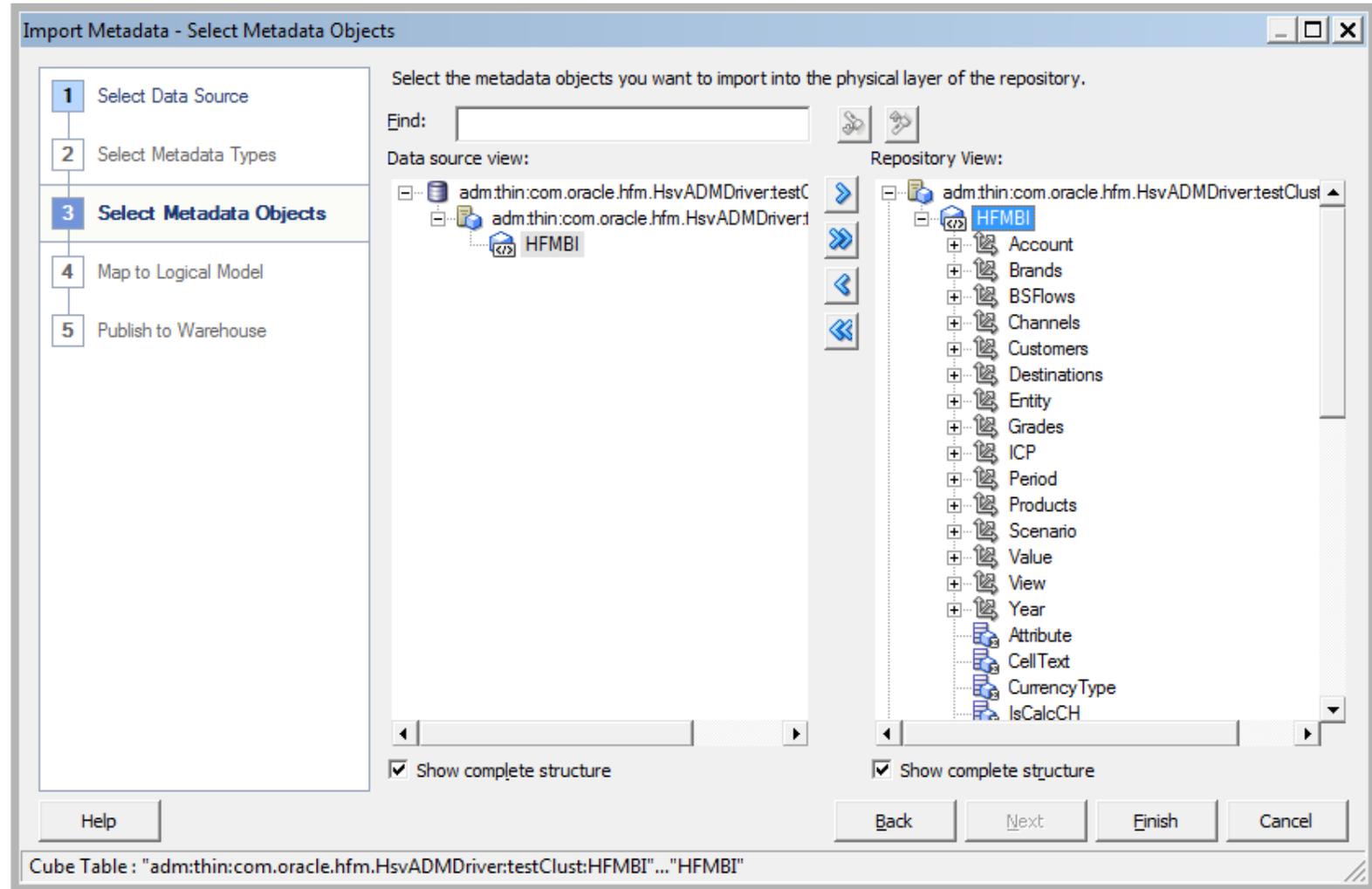
URL:

Provider Type:

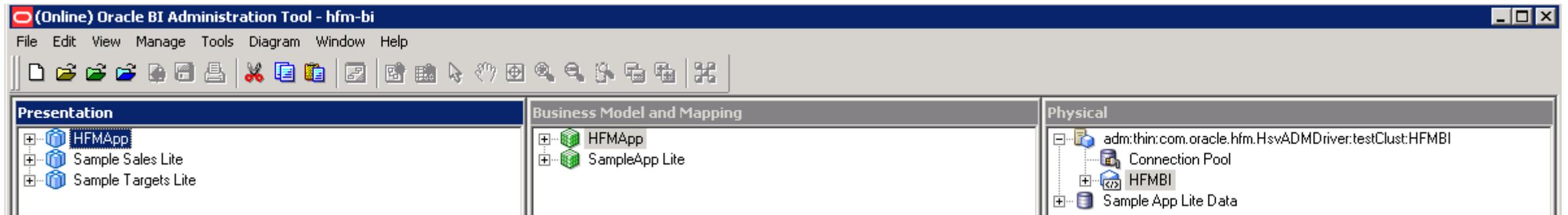
User Name:

Password:

Oracle Hyperion Financial Management



Oracle Hyperion Financial Management



State of the Union

- Technically integrated and doable
- Functionally still not perfect
 - different teams
 - different ownership
 - different methods and timeframes
- Essbase is clearly the better integrated one
 - Because it's a data source first and not an "application"
- EPM will anyway continue to use their own reporting tools most of the time

Oracle Analytics & EPM Sources: Best Friends Forever

Questions?