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"

Gianni Ceresa

- 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
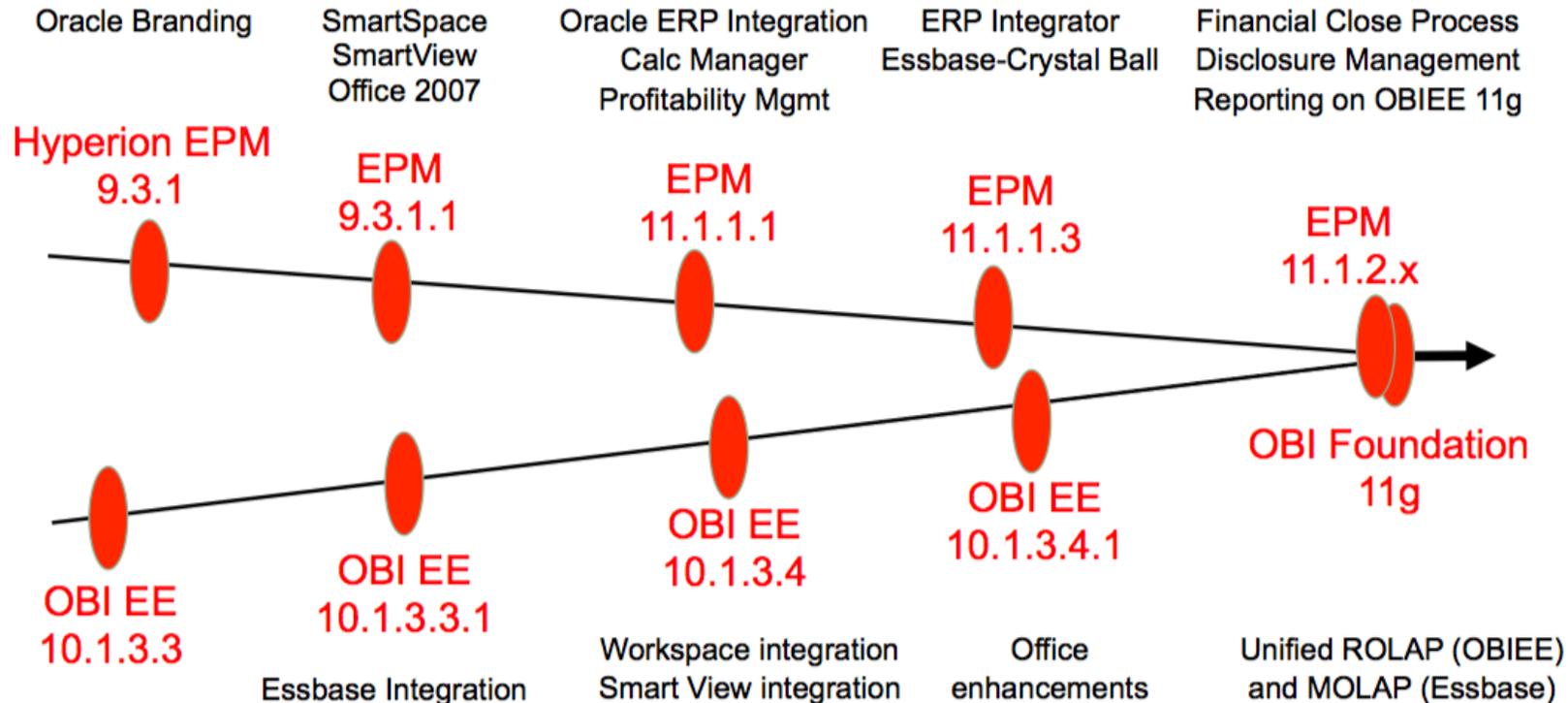- Unstructured & Semi-Structured
- Excel XML/Office
- Business Processes

EPM meet BI: Reality or Fake news?

Product Integration Status

Oracle Branding	SmartSpace SmartView Office 2007	Oracle ERP Integration Calc Manager Profitability Mgmt	ERP Integrator Essbase-Crystal Ball	Financial Close Process Disclosure Management Reporting on OBIEE 11g
Hyperion EPM 9.3.1	EPM 9.3.1.1	EPM 11.1.1.1	EPM 11.1.1.3	EPM 11.1.2.x
OBI EE 10.1.3.3	OBI EE 10.1.3.3.1	OBI EE 10.1.3.4	OBI EE 10.1.3.4.1	OBI Foundation 11g
	Essbase Integration	Workspace integration Smart View integration	Office enhancements	Unified ROLAP (OBIEE) and MOLAP (Essbase)

ORACLE

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

Essbase

	ACTUAL 2015									BUDGET SEP 2015	VARIANCE %		COMMENTS
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP				
+ 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 * — Measures
Generation 2, Level 2 — Profit
Generation 3, Level 1 — Margin
Generation 4, Level 0 — Sales
Generation 4, Level 0 — Cost of Goods Sold
Generation 3, Level 1 — Total Expenses
Generation 4, Level 0 — Marketing
Generation 4, Level 0 — Payroll
Generation 4, Level 0 — Misc
Generation 2, Level 1 — Inventory
Generation 3, Level 0 — Open Inventory
Generation 3, Level 0 — Additions
Generation 3, Level 0 — Ending Inventory
Generation 2, Level 1 — Ratios
Generation 3, Level 0 — Margins %
Generation 3, Level 0 — Profit %
Generation 3, Level 0 — Profit per Ounce
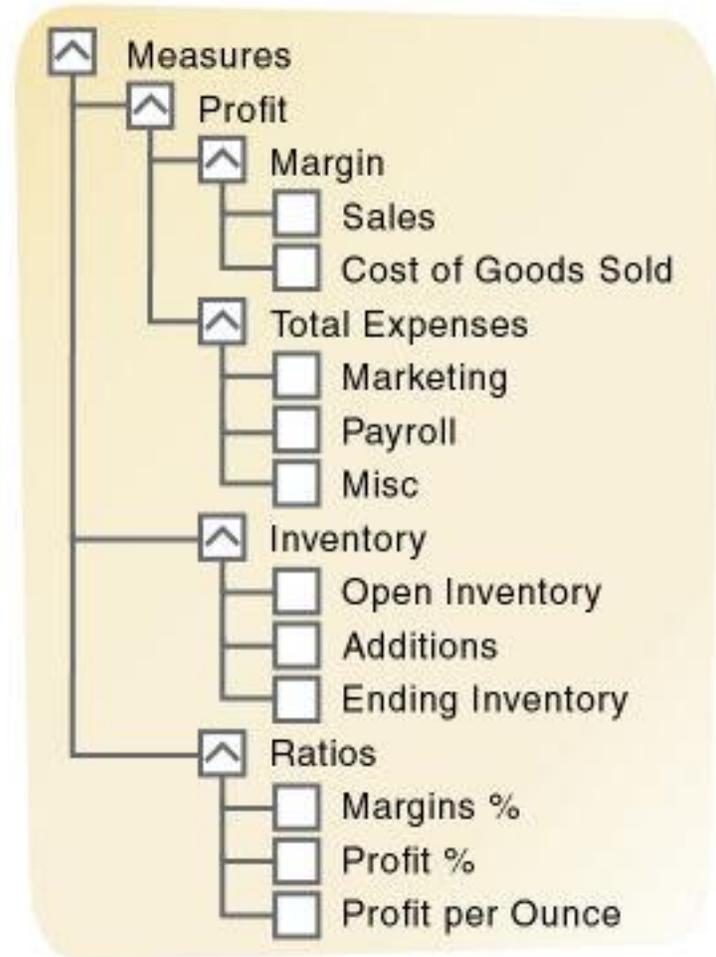
* The level of Measures depends on the branch

Connecting OBIEE to Essbase

User requests from dashboard, ad-hoc queries etc

HTTP(S)

BI Presentation Server Component

Logical SQL ↓   ↑ Results

Physical SQL, MDX

Standalone Essbase Server

Results

Oracle BI Server Component

Read model ↑

Shared Services for User / Roles

Oracle BI Repository Logical Business Model

Something security

Common Enterprise Information Model

BI Server

BI Server automatically uses aggregates or cubes for performance

ESSBASE

Native RDBMS

Data Warehouse

BI Apps or any DW or OLTP schema

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

M1 Measures Hier	▶ Calendar
	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
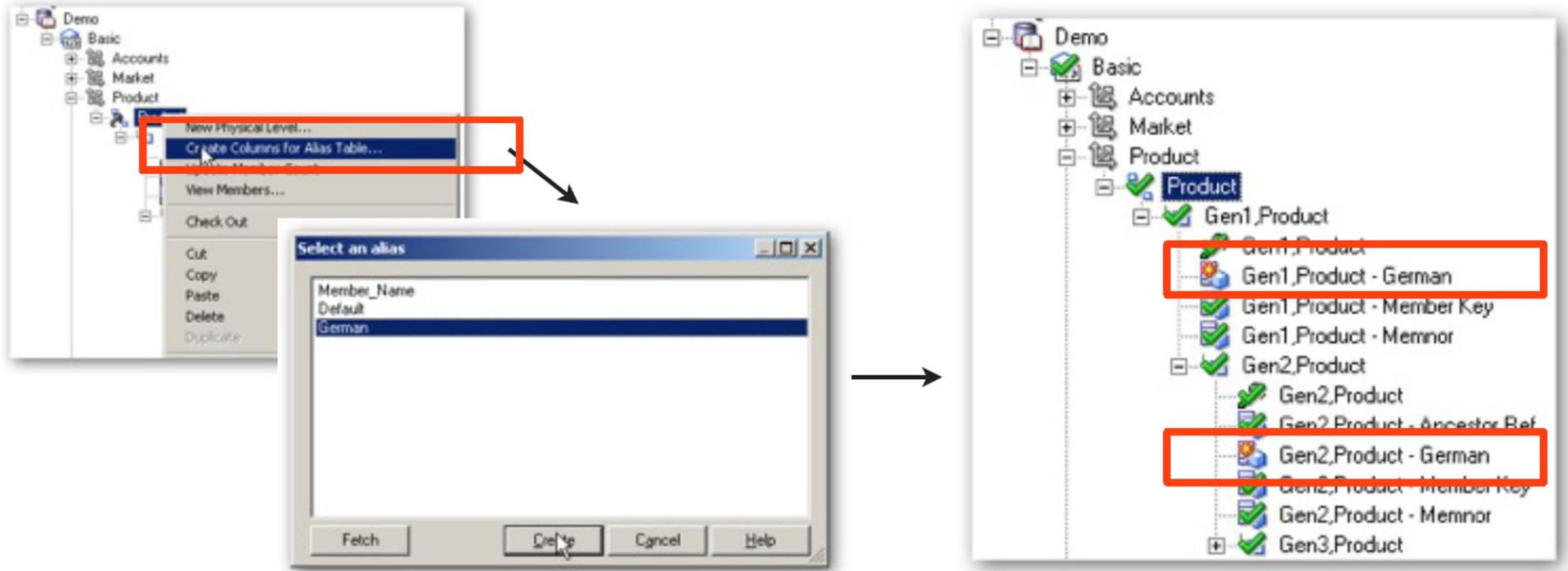
Essbase status?

- 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
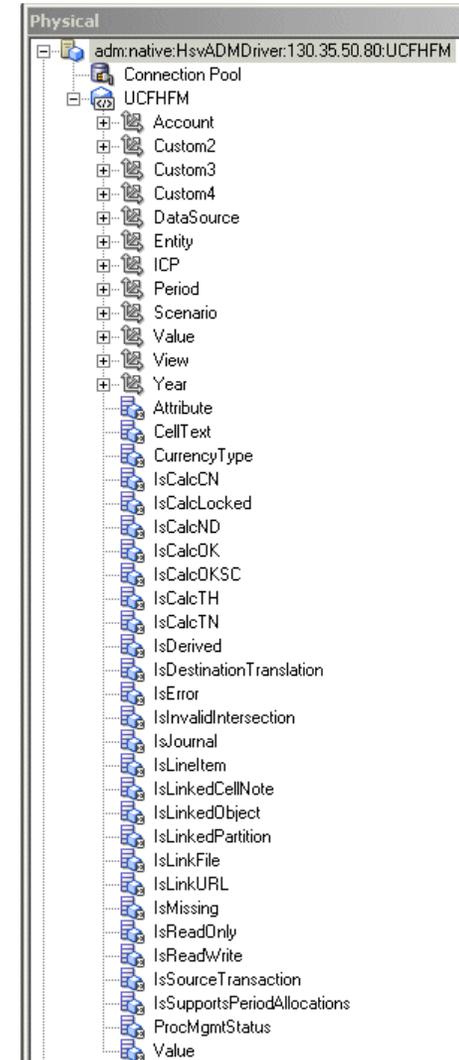
But first, what is the challenge with Planning?

- 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

- 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?

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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
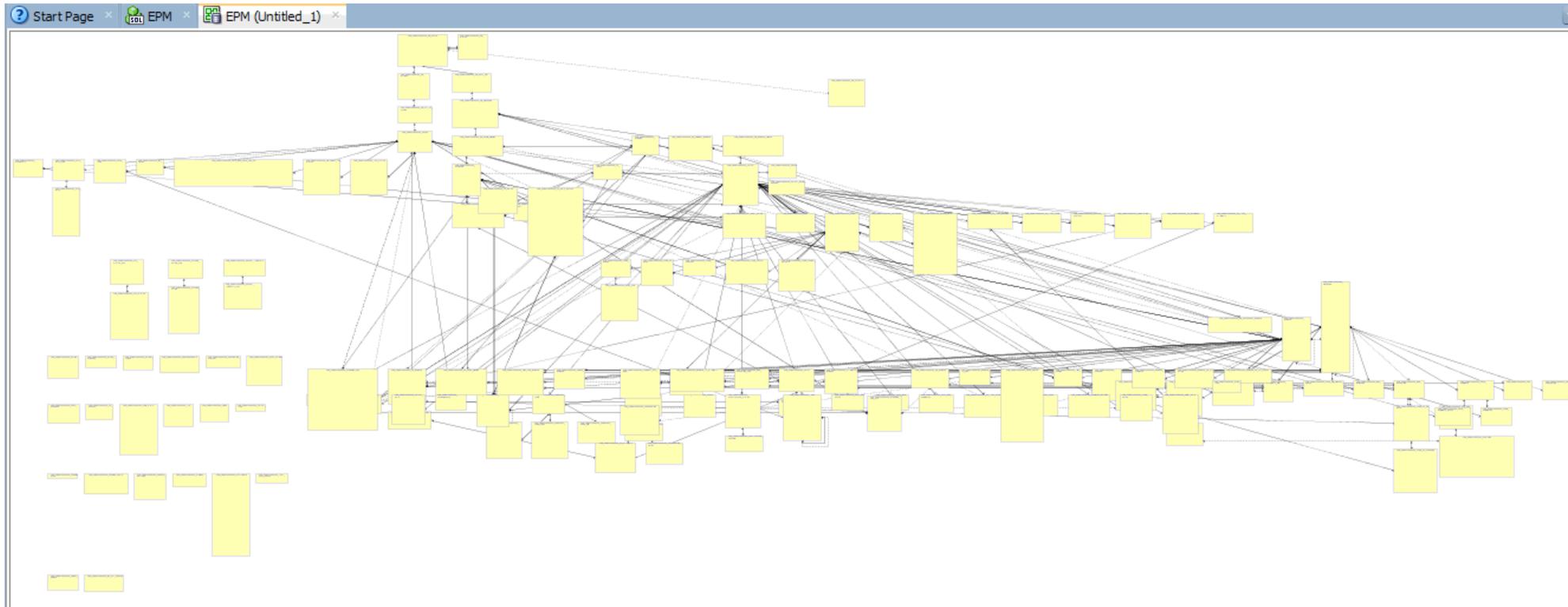
A reminder: what is Hyperion Planning?

- The outline is stored in few tables
- HSP_OBJECT is a central object
  - parent-child structure
    - PARENT_ID = OBJECT_ID
  - members names
  - aliases
  - etc.
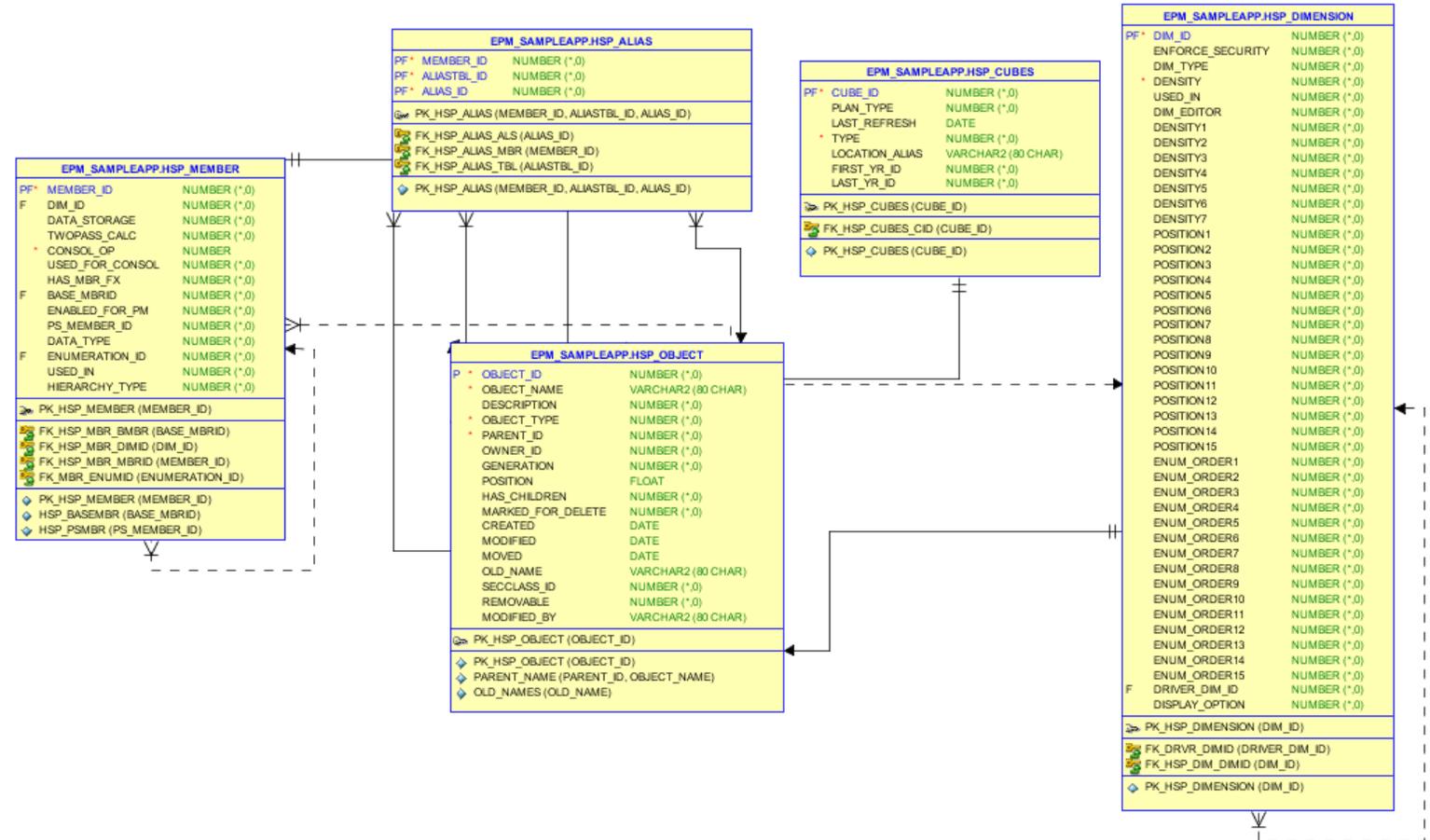
Back to OBIEE: import Metadata

- 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)

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
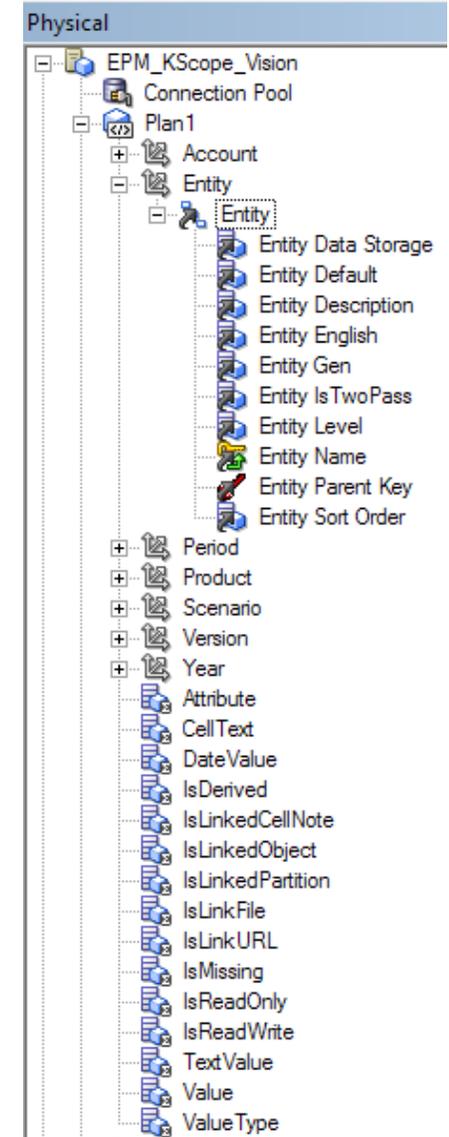
Does it work? Planning analysis sample in OBIEE

Planning analysis sample in OBIEE

Plan vs Target

Year Name FY14 ▼

Entity Default	Entity Name	Account Name	Version Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total Department	TD	0000: Net Income	Working	11,626,935	10,482,677	17,503,838	17,851,495	13,831,423	19,768,470	19,410,324	21,790,649	22,104,965	16,120,945	20,561,677	26,607,843
			Target	10,333,692	796,950	7,626,029	9,696,936	3,930,102	8,337,462	3,618,554	9,532,006	8,054,929	9,320,827	8,648,273	15,653,756
		Cash Ending Balance	Working	1,556,370,510	1,002,945,497	1,304,121,610	1,382,810,537	1,201,393,602	1,341,677,320	1,367,192,092	1,468,069,765	1,472,514,719	1,389,458,696	1,439,722,792	1,538,439,108
			Target	10,333,692	796,950	7,626,029	9,696,936	3,930,102	8,337,462	3,618,554	9,532,006	8,054,929	9,320,827	8,648,273	15,653,756
		Total Cash Flow	Working	1,024,240,418	518,304,952	773,308,080	834,943,777	655,354,074	761,204,797	770,067,013	844,050,712	827,161,508	727,000,857	755,878,595	826,996,520
			Target	10,333,692	796,950	7,626,029	9,696,936	3,930,102	8,337,462	3,618,554	9,532,006	8,054,929	9,320,827	8,648,273	15,653,756

Year Name FY14 ▼

◀◀ 0000: Net Income   Cash Ending Balance   Total Cash Flow ▶▶

Legend: Working, Target

Y-axis: 30M, 25M, 20M, 15M, 10M, 5M, 0M

X-axis (Period Name): Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec
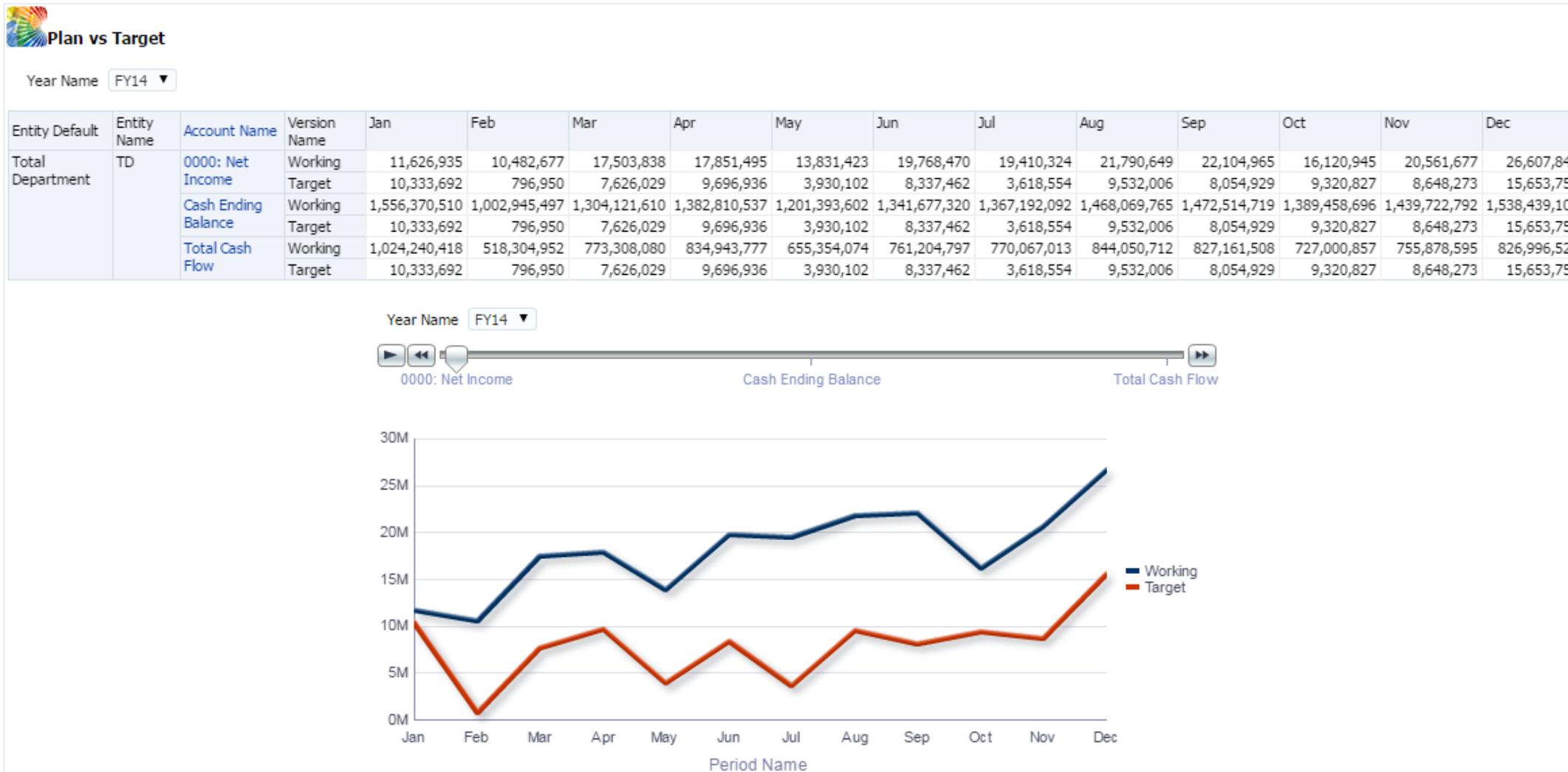
But what is this ADM driver?

- 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
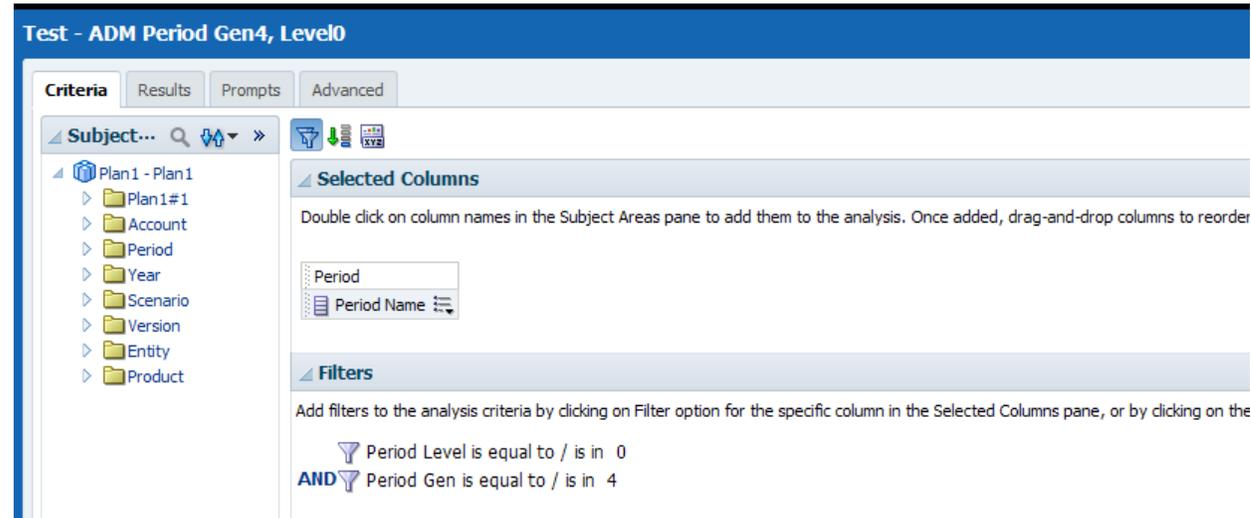
ADM example – Test case

- Extremely simple example to see how the new ADM source works
  - Dimension "Period"
  - List of member names
  - Filter
    - Generation = 4
    - Level = 0
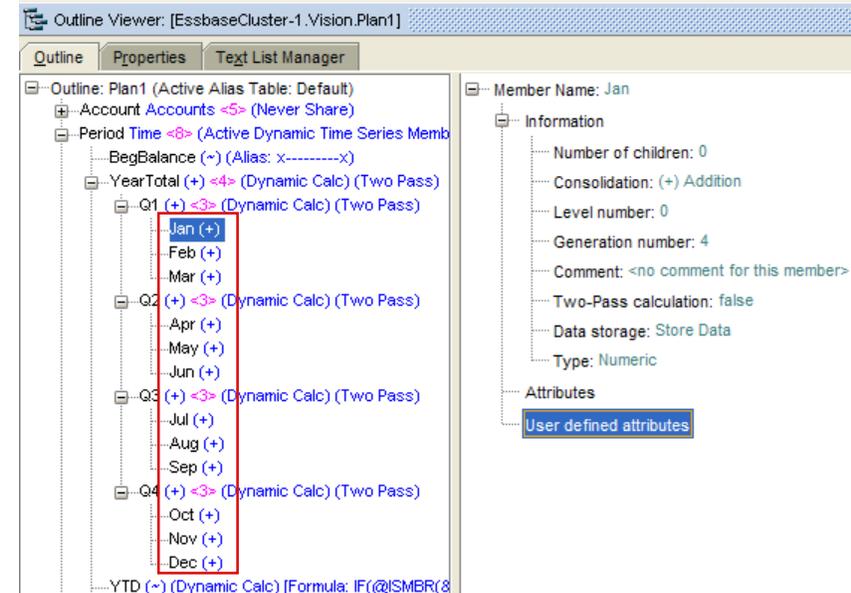
- Expected result:
  - Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec
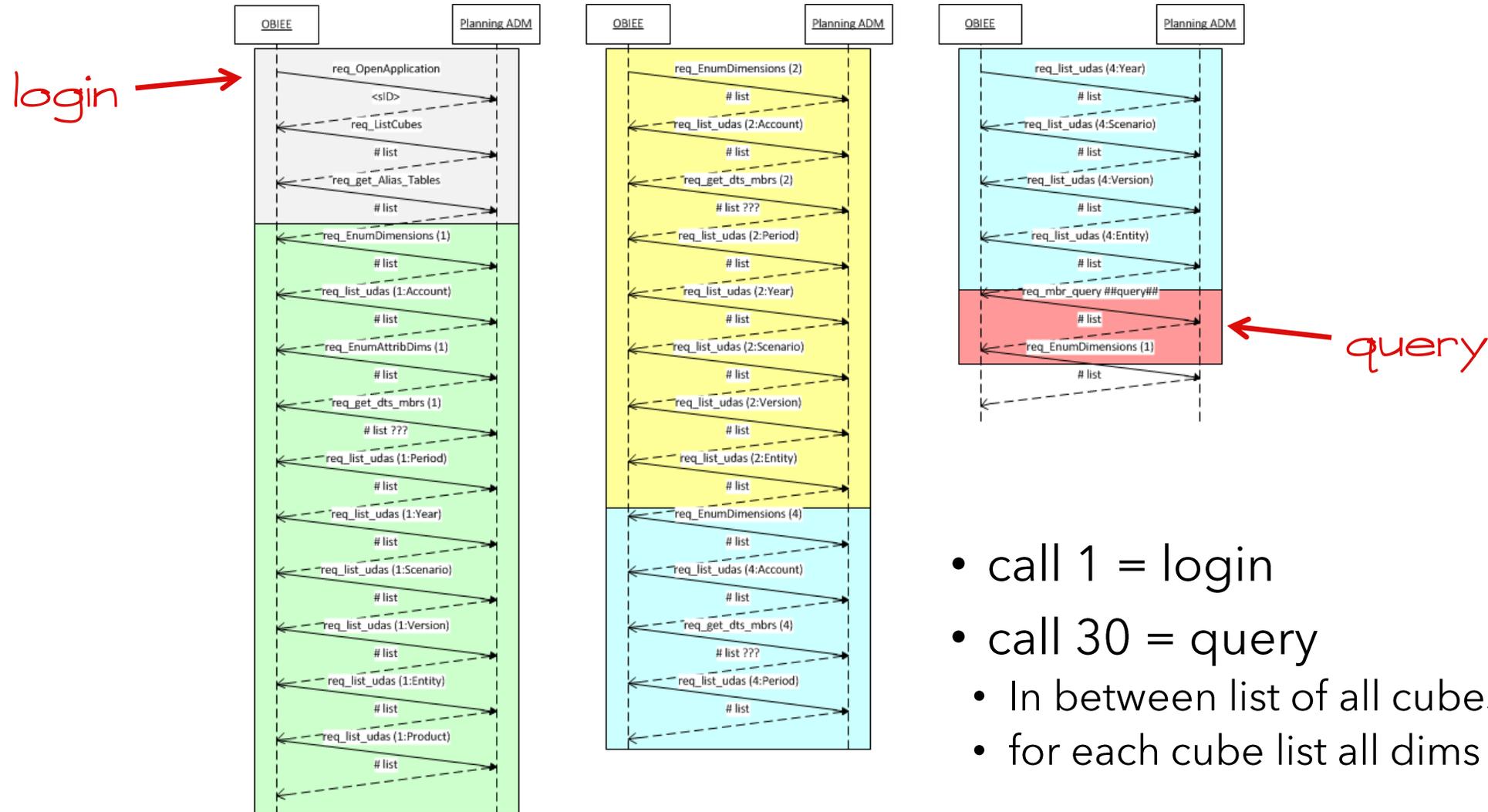
ADM example – OBIEE

- 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

- 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
<?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…

- result of the "req_mbr_query" call:

```
<?xml version="1.0" standalone="yes"?>
<res_mbr_query><sID>...</sID>
<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
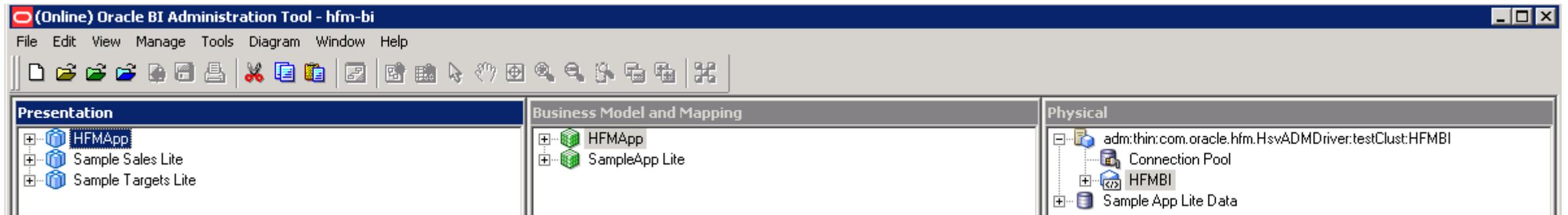
Oracle Hyperion Financial Management
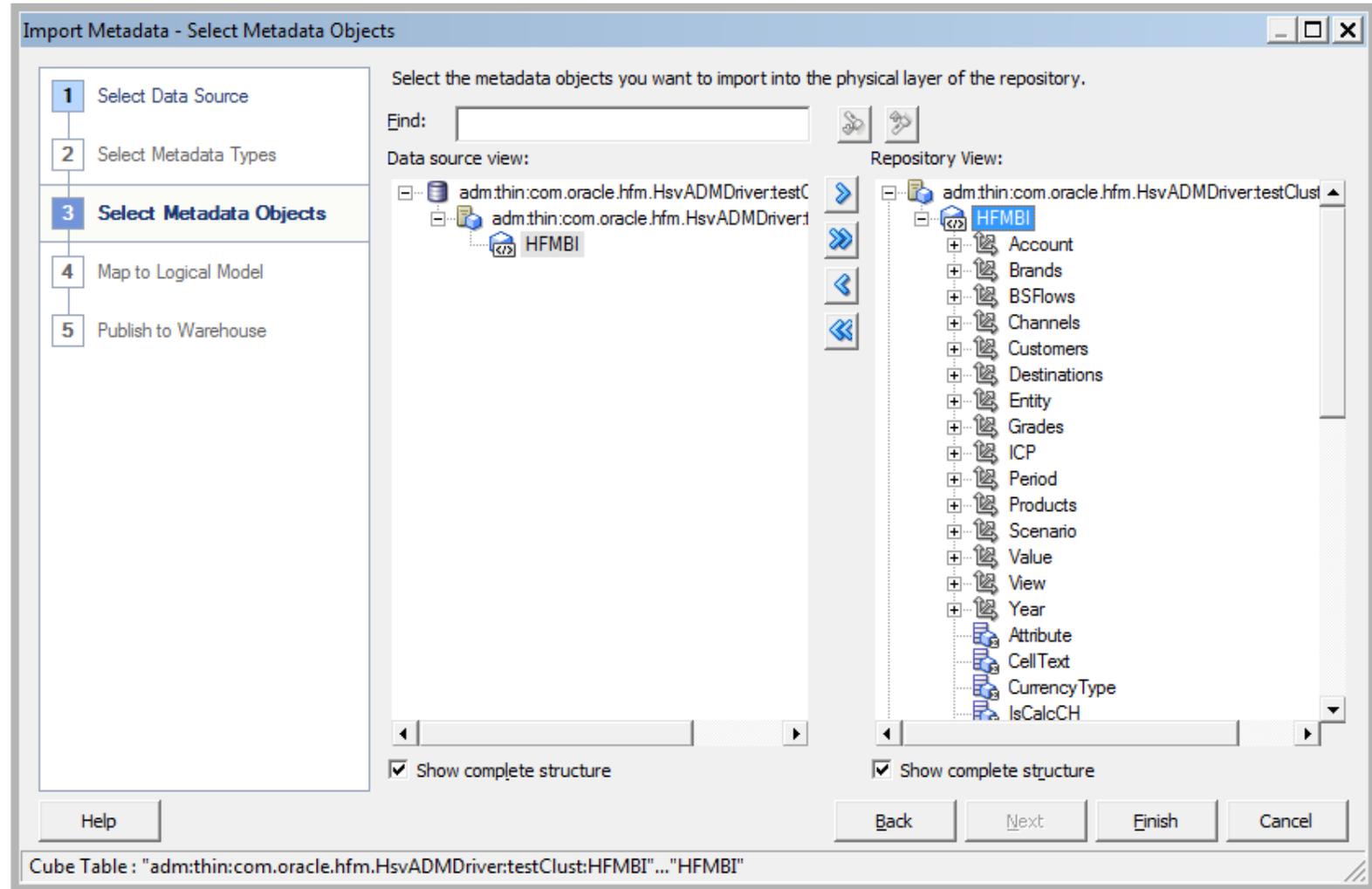
Oracle Hyperion Financial Management

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

Questions?