

Using Essbase as a Physical Data Source for OBIEE

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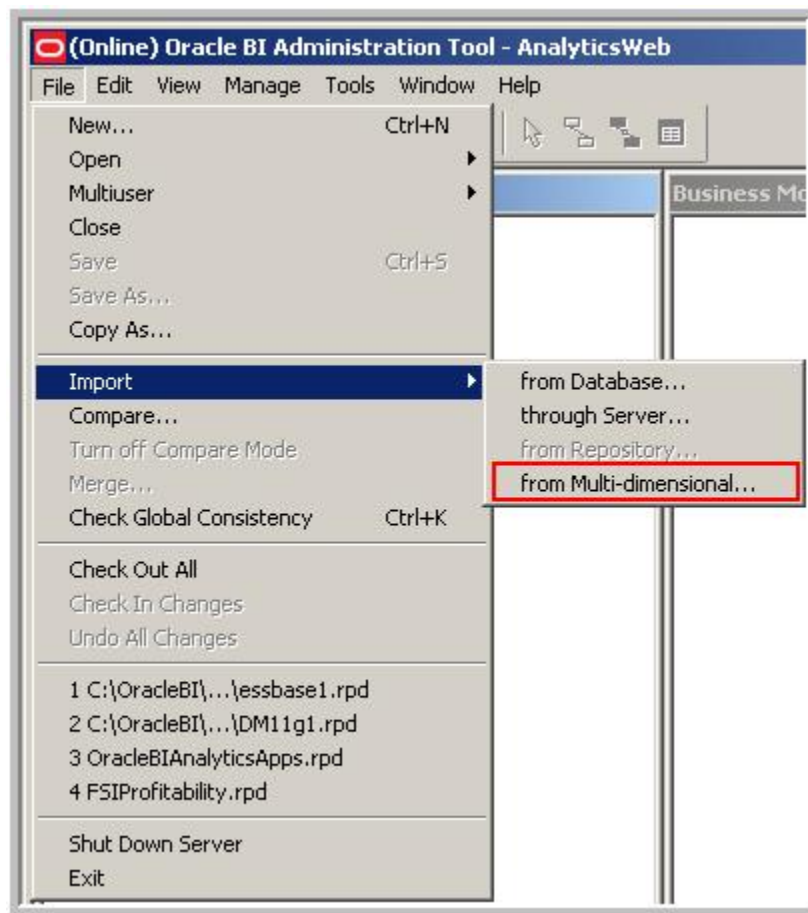
INTRODUCTION

The ability to use Essbase as a source for Oracle BI Administrator gives you the opportunity to expose your Essbase data to a broad user audience with OBIEE Dashboards and Answers. When Essbase is used as an OBIEE data source, you have the capability to combine Essbase sources with other OBIEE Server supported data sources, and present relevant information to your users in one place, from multiple sources.

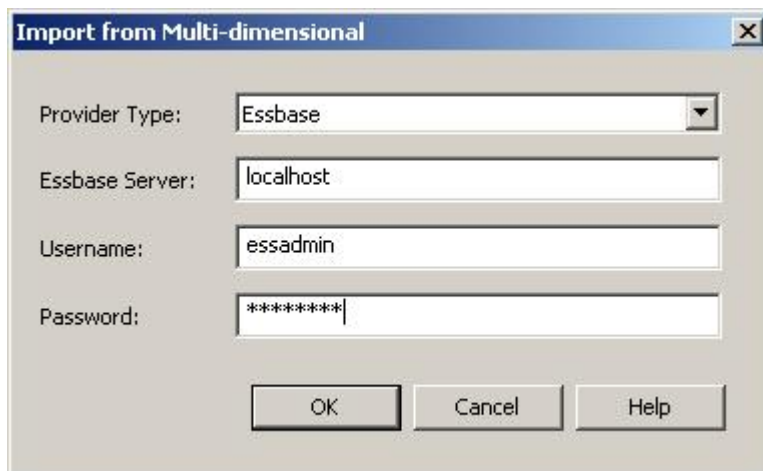
The Oracle BI Server version 10.1.3.3.2 Administrator Tool features a new import dialog specifically for multi-dimensional data sources. (Note: the Essbase metadata import and its related queries require installation of the Essbase client API on BI Server.)

PHYSICAL LAYER

The first step is to import from a database, just as you would with relational tables. With Essbase, the command is **File ... Import ... From Multi-Dimensional**.



Fill in the appropriate information and click **OK**.



The 'Import from Multi-dimensional' dialog box contains the following fields and buttons:

- Provider Type: Essbase (dropdown menu)
- Essbase Server: localhost (text field)
- Username: essadmin (text field)
- Password: ***** (password field)
- Buttons: OK, Cancel, Help

Select an Essbase database to import from and click **Import**.



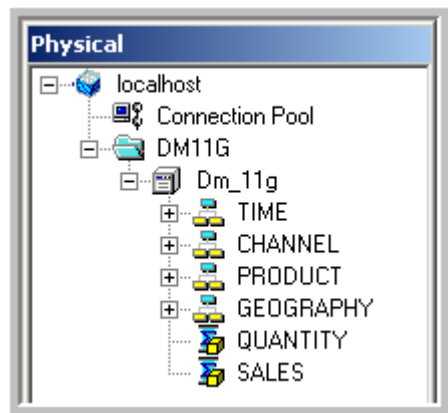
The 'Select Source' dialog box displays a tree view of Essbase databases under the 'localhost' root. The 'Dm_11g' database is selected. The dialog includes 'Import' and 'Close' buttons.

Please select a catalog or cubes from a catalog

- localhost
 - Demo
 - Sample
 - Sample_U
 - Samppart
 - Sampeast
 - DMDemo
 - ASOsamp
 - XwkPOC
 - XwkPOCFn
 - Bigcorp1
 - Bigcorp
 - DM11G
 - Dm_11g (selected)

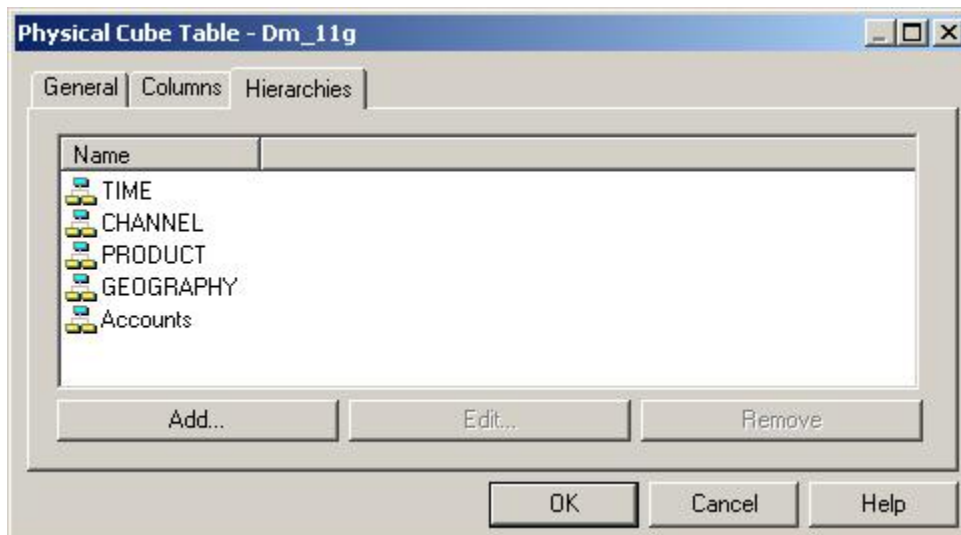
Buttons: Import, Close

In the Physical Layer, we see the dimension tables and measures that were imported from the Essbase database. Here we see Time, Channel, Product, and Geography dimensions, along with Quantity and Sales as the measures.



If you're familiar with Essbase, you're accustomed to seeing an Accounts dimension when you look at an Essbase model, and that's where each of these "measures" were stored in the Essbase database – they were part of the Accounts dimension. What happened?

When we double-click the Physical Cube Table and go to the Hierarchies tab, we'll see that the Accounts dimension is indeed still in the list.



Double-clicking on **TIME** reveals a dimension type of **Time dimension** as expected.

The screenshot shows a dialog box titled "Hierarchy - TIME". It has a "Levels" tab selected. The fields are as follows:

Field	Value
Name:	TIME
External Name:	TIME
Dimension Name:	TIME
Dimension Type:	Time dimension
Hierarchy Type:	Fully balanced

The Market, Product, and Scenario dimensions each have a dimension type of **Other**.

Double-clicking on **Accounts** reveals a dimension type of **Measure Dimension**.

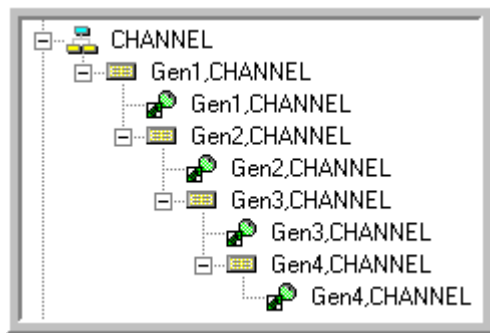
The screenshot shows a dialog box titled "Hierarchy - Accounts". It has a "Levels" tab selected. The fields are as follows:

Field	Value
Name:	Accounts
External Name:	Accounts
Dimension Name:	Accounts
Dimension Type:	Measure Dimension
Hierarchy Type:	Fully balanced

This is the Dimension Type that BI Administrator looks for when importing from an Essbase data source, and it automatically converts the values in that dimension into Measures.

Special Note: If you want to continue to keep the Accounts dimension and its hierarchy intact, switch it to an "Other" dimension type, and switch one of the other dimensions to a "Measure" dimension type. One of the Essbase dimensions **MUST** be identified as a Measure dimension.

Unlike the more traditional use of relational tables as an OBIEE data source, the Essbase data structures already understand the relationships between levels of the hierarchies. Instead of having to manually identify keys and joins in the Physical Layer and in the Business Model and Mapping Layer, the Essbase data relationships are imported and used. Drilling down on the Channel dimension, we see that these aren't just tables with columns. They are already hierarchical structures.



BUSINESS MODEL AND MAPPING LAYER

As was the case in the Physical Layer, building the Business Model layer is much simpler when using an Essbase source. Click, drag, and drop the physical cube table onto the empty Business Model and Mapping layer, and the basic structures of the business model will already be in place.

- There's no need to manually create the complex joins between the logical table columns.
- Hierarchies are already created – no need to define them or to map levels
- Measures are already assigned an aggregation type

Dimensional hierarchies are pre-built.

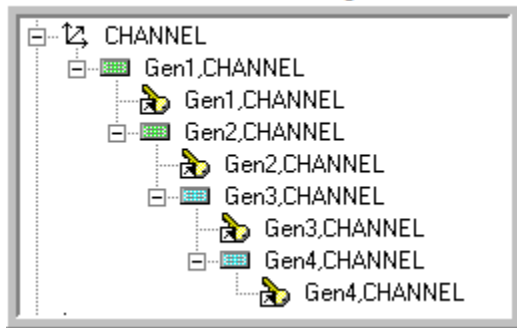


Table relationships are pre-defined.



Note the yellow and white icons.

However, there are still several tasks on the “to do” list for the business model.

Estimating Number of Members at Each Levels

Just as was the case with the relational model, we'll need to run the **Estimate Levels** tool for all dimensions in the business model. Simply right-click on the business model name and select **Estimate Levels** from the dropdown menu.

Change logical levels names

The Essbase concept of **Generations** within a hierarchy has been used in the naming of the physical table columns, and therefore of the logical table columns and the dimension levels within each hierarchy (such as **Gen3,Channel**). Although we could simply leave them alone in the business model and change them in the Presentation Layer to make them more “BIEE-like” for our users, there are good reasons to go ahead and change their display names in the Business Model and Mapping layer.

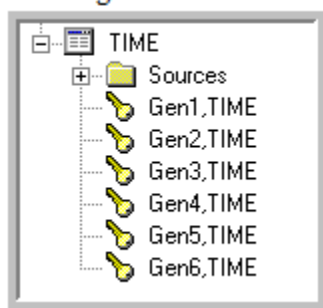
- When defining time series measures (TODATE, AGO), it is much easier to visually identify the **year** level, rather than having to remember that Year is **Gen3,Time**.
- Likewise, when defining level-based measures, it is easier to visually identify the **Region** level in the Geography hierarchy than it is to remember that Region is **Gen3,Geography**.



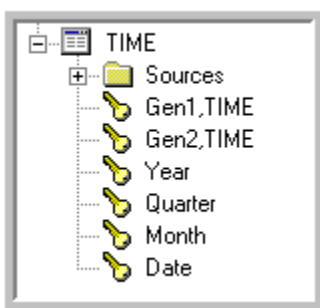
Helpful Hint: The easiest way to identify the contents (and therefore the new names) of the logical levels is to go ahead and drag the entire business model into the Presentation Layer, check in changes (if working in online mode), check consistency, and save the repository. Then just go into Answers, display the top level of each hierarchy, and drill down on each level until you get to the bottom. You'll be able to see what each **Gen** represents, and you can then go back to the Administration Tool and modify the business model.

1. Change the logical column names in the usual fashion, by double-clicking the logical column and typing a new name. For convenience in working with the Business Model objects, only rename those logical columns that you're going to expose to the users in the Presentation Layer. That way, you can tell the difference between display objects and non-display objects when you're working in the Business Model layer. For example, in Essbase, Gen1,Time is the Time dimension itself, and Gen2,Time is the All Times level. If we're not going to expose either of those levels to our users, our Time logical table would change like this:

The original model...



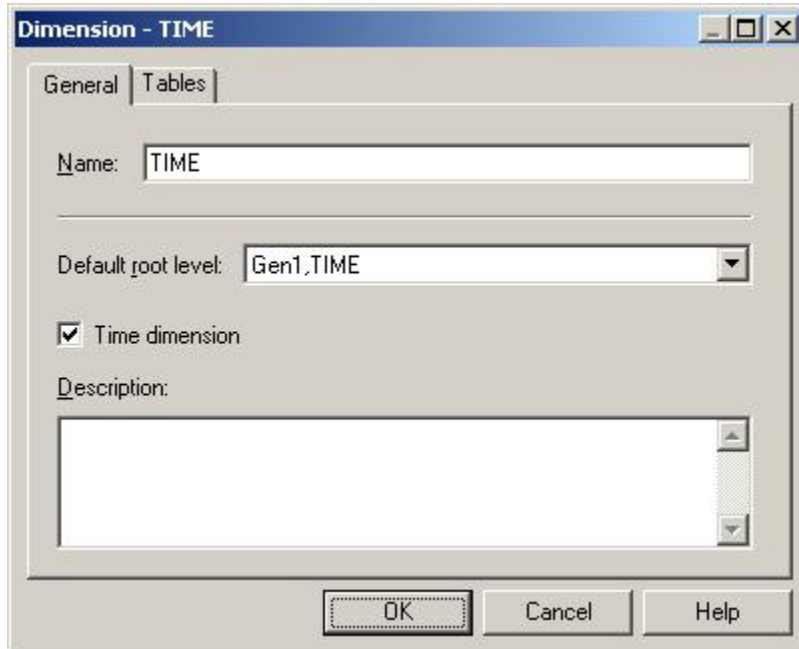
...becomes this.



Establish a Time Dimension

Although we saw earlier that TIME is marked as a Time Dimension in Essbase, the import didn't really do much with that information. We have to create some Time Dimension characteristics in order to make the Time dimension display in the proper order, and to be able to create time series measures such as Year To Date (the TODATE function) and Prior Quarter (the AGO function).

The first step is to double-click the TIME dimension and select the **Time Dimension** box, just as we would with a relational data source.



Next, drill down on the Time dimension all the way down to Gen6, Time. Double-click the Gen6, Time level, go to the **Keys** tab, and select Gen6,Time as the **Chronological Key**.

Change Time dimension level names

When you create ToDate and Ago measures in the Business Model and Mapping layer, you'll need to reference a Time dimension. The levels from which you can select are the names of the levels as shown in the Dimension, not the dimension table. For that reason, you'll probably want to rename the Dimension Level names appropriately, so that you can select Year or Quarter, rather than having to remember that those are Gen3,Time and Gen4, Time.

Create Time Sorting Columns

Next we'll need to clean up the dimension sorting. Just like every other dimension, Time is originally sorted in alphabetical order. That leads to some interesting default displays, such as:

This query...

Columns
Click on column names in the selecti name. (?)

Times

Year ↓↑ Month ↓↑

Display Results Remove All

Filters
Add filters to the request criteria by ho its name in the selection pane. (?)

Year is equal to / is in 2004

Save Filter... Remove Filters

... producing these results

Year	Month
2004	Apr-04
	Aug-04
	Dec-04
	Feb-04
	Jan-04
	Jul-04
	Jun-04
	Mar-04
	May-04
	Nov-04
	Oct-04
	Sep-04

or this query...

Columns
Click on column names in the selecti name. (?)

Times

Quarter ↓↑ Month ↓↑

Display Results Remove All

Filters
Add filters to the request criteria by ho its name in the selection pane. (?)

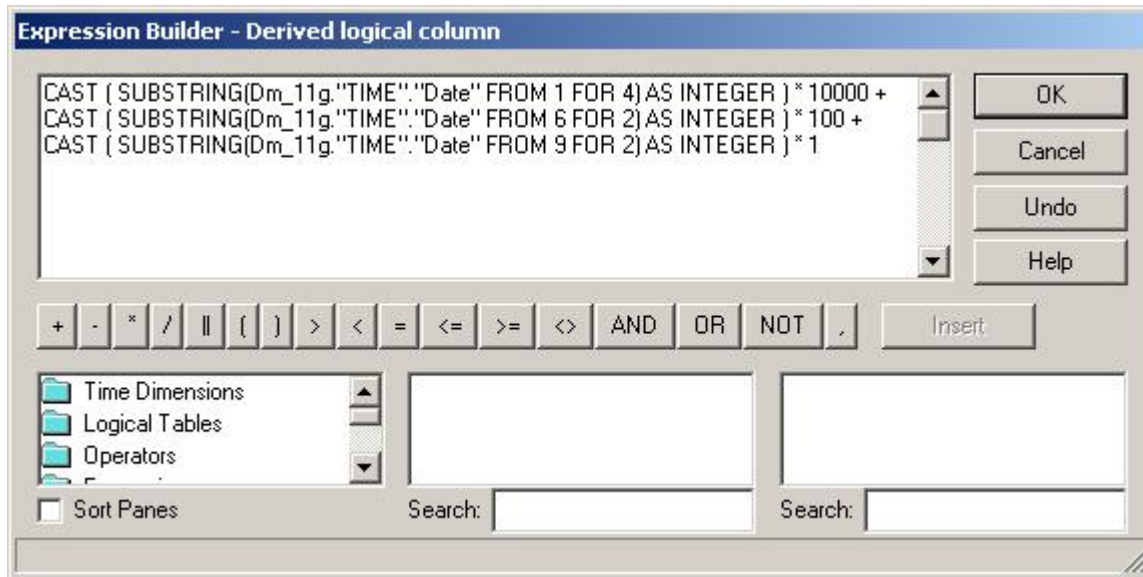
Year is equal to / is in 2004

...producing these results

Quarter	Month
Q1-04	Feb-04
	Jan-04
	Mar-04
Q2-04	Apr-04
	Jun-04
	May-04
Q3-04	Aug-04
	Jul-04
	Sep-04
Q4-04	Dec-04
	Nov-04
	Oct-04

It may be possible that your Essbase data source already has a column which can be used for sorting the Time dimension. However, in the absence of any built-in column that can serve as a chronological sort order, we can create some logical columns by hand.

Right-click the **Time** logical table and select **New Object ... Logical Column**. We'll name it **Day Sort Order**, click **Use existing logical columns as the source**, and click the **Expression Editor (...)** button. Enter the formula shown here and click **OK**.



This formula is taking a string like **2004-04-22** and converting it to the integer **20040422**, thereby creating an integer column that we can sort on.

We'll repeat that process to create an integer column like **20040400** for **Month Sort Order**...

```
CAST ( SUBSTRING(Dm_11g.\"TIME\".\"Date\" FROM 1 FOR 4) AS INTEGER ) * 10000 +
CAST ( SUBSTRING(Dm_11g.\"TIME\".\"Date\" FROM 6 FOR 2) AS INTEGER ) * 100
```

...and another integer column like **200401** for **Quarter Sort Order**.

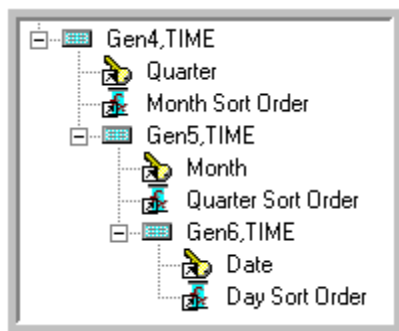
```
CAST ( SUBSTRING(Dm_11g.\"TIME\".\"Quarter\" FROM 6 FOR 4) AS INTEGER ) * 100 +
CAST ( SUBSTRING(Dm_11g.\"TIME\".\"Quarter\" FROM 2 FOR 1) AS INTEGER ) * 1
```

You can use any valid syntax. The example shown above for Day Sort Order might also be:

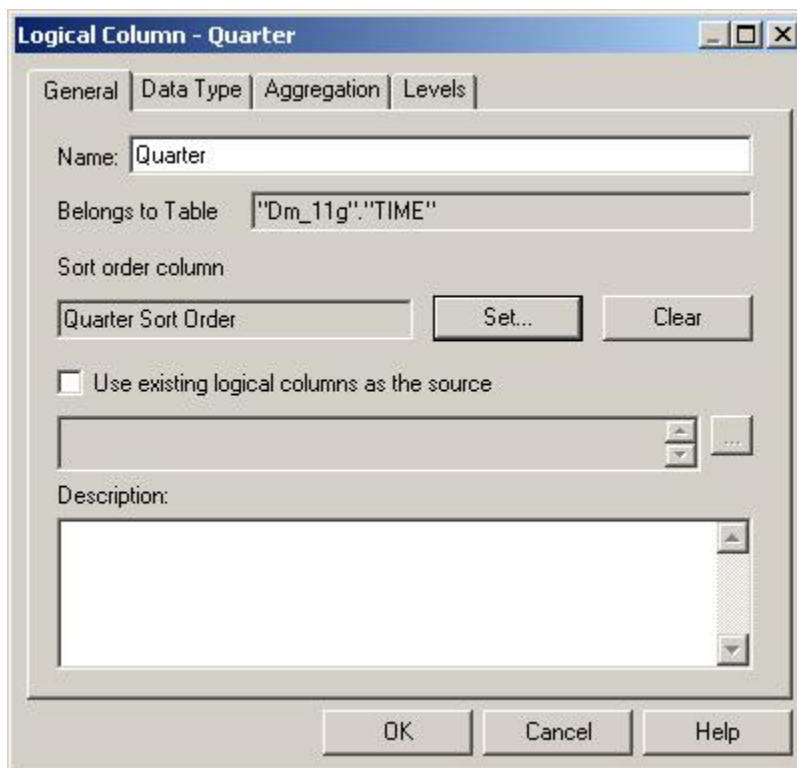
```
CAST(REPLACE(SUBSTRING(DM_11G.\"TIME\", \"DATE\" FROM 1 FOR 10), '-', '' ) AS INTEGER)
```

Assign Time Sorting Columns

Now we'll assign these new columns as the sort order for their respective levels. Drag each of the new logical columns onto its corresponding level in the Time dimension.



Double-click the **Quarter** logical level, and next to the Sort order column, click the **Set...** button. Select the **Quarter Sort Order** column that we just created. The Logical Column dialog box will look like this:



Repeat that same process for the **Month** and **Day** logical levels, assigning their respective sort order columns.

PRESENTATION LAYER

From this point forward, the process of building the repository is identical to the process used with relational data sources. You can drag and drop the Business Model into the Presentation panel to create the Presentation Layer. Or you can create your TODATE and AGO measures (if they aren't already coming from Essbase). And you can make your normal changes to the Presentation Layer, like moving columns around and so forth, to make your repository complete.

SUMMARY

Including Oracle Essbase as an OBIEE data source is quite easy, and very quick. If you are currently using Essbase, or are considering adding it to your technical environment, it can be easily exposed to your users through OBIEE.

BACKGROUND

Mark Thompson is a Senior Consultant with Vlamis Software Solution. Vlamis Software Solutions specializes in Oracle-based Business Intelligence solutions, including relational BI, Oracle OLAP, Oracle Essbase, and the Oracle Business Intelligence Enterprise Edition suite. The company has been an industry leader in Oracle BI and OLAP technologies for the past 20 years, and presents multiple BI technical sessions at Oracle OpenWorld, Collaborate, and BIWA conferences each year.

The company founder and President, Dan Vlamis, is the 2008 chair of the BIWA Summit, being held Dec 2-3 at Oracle's headquarters in San Francisco. For more information, or to sign up for your free membership, visit www.oraclebiwa.org.

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