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PeopleTools 8.51 PeopleBook: PeopleSoft Cube Builder

August 2010

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PeopleTools 8.51 PeopleBook: PeopleSoft Cube Builder
SKU pt8.51tcub-b0810

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PeopleSoft Cube Builder Preface

This PeopleBook refers to PeopleSoft Cube Builder.

PeopleSoft Cube Builder

PeopleSoft Cube Builder is a set of PeopleTools pages and processes that you use to create and maintain Essbase applications and databases. It also provides mechanisms to interconnect PeopleTools with Oracle Enterprise Performance Manager tools such as Smart View.

Note. The concepts and terminology used in PeopleSoft Cube Builder are the same concepts used in Oracle Enterprise Performance Manager, which is the suite that contains Essbase and Smart View. For more information, see the documentation for Oracle Hyperion products.

PeopleBooks and the PeopleSoft Online Library

A companion PeopleBook called *PeopleBooks and the PeopleSoft Online Library* contains general information, including:

- Understanding the PeopleSoft online library and related documentation.
- How to send PeopleSoft documentation comments and suggestions to Oracle.
- How to access hosted PeopleBooks, downloadable HTML PeopleBooks, and downloadable PDF PeopleBooks as well as documentation updates.
- Understanding PeopleBook structure.
- Typographical conventions and visual cues used in PeopleBooks.
- ISO country codes and currency codes.
- PeopleBooks that are common across multiple applications.
- Common elements used in PeopleBooks.
- Navigating the PeopleBooks interface and searching the PeopleSoft online library.
- Displaying and printing screen shots and graphics in PeopleBooks.
- How to manage the locally installed PeopleSoft online library, including web site folders.
- Understanding documentation integration and how to integrate customized documentation into the library.
- Application abbreviations found in application fields.

You can find this companion PeopleBook in your PeopleSoft online library.

Chapter 1

Getting Started with PeopleSoft Cube Builder

This chapter provides an overview of PeopleSoft Cube Builder and discusses:

- PeopleSoft Cube Builder integrations.
- Other sources of information.
- Implementation.

PeopleSoft Cube Builder Overview

PeopleSoft Cube Builder is an extract-transform and load (ETL) application that enables you to use PeopleSoft Query and PeopleSoft Tree Manager to build Essbase applications and online analytical processing (OLAP) databases. It comprises an easy to use graphic user interface to create metadata of cubes based in PeopleSoft structures and to give a look and feel similar to the Essbase Outline Editor. It also uses an enhanced cube builder program that provides fast performance to load data and metadata, as well as interconnections with the Oracle Enterprise Performance Manager - Smart View.

Note. To view outputs from PeopleSoft Pure Internet Architecture, you must have Smart View for Office installed on the client machine. Please refer to the Oracle Smart View for Office Installation Guide for details.

PeopleSoft Cube Manager is the legacy engine used before PeopleTools 8.50 to create cubes in diverse OLAP engines, including Essbase. Although PeopleSoft Cube Manager has been updated to the new Essbase API, only PeopleSoft Cube Builder contains all the new Essbase features, such as Unicode support, Aggregate Storage, and a wider set of member and dimension properties.

The two calculation engines available to build cubes are:

- Essbase Cube Builder

  Use Essbase Cube Builder, the default calculation engine, to build Essbase cubes. To access this tool, select PeopleTools, Cube Builder, Essbase Cube Builder.

- Cube Manager

  Use Cube Manager to build *legacy* Essbase, Cognos, and Star Schema cubes. To access this tool, select PeopleTools, Cube Builder, Cube Manager.

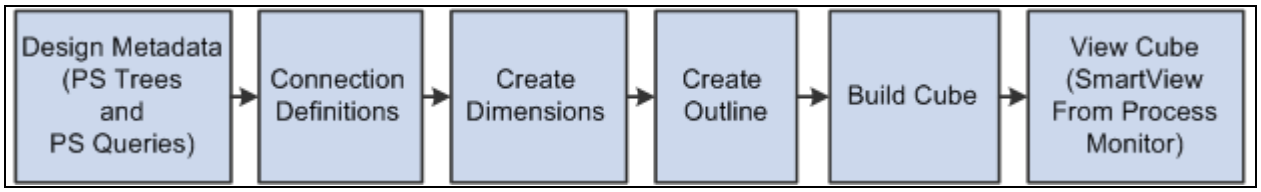
  See *PeopleTools 8.51 PeopleBook: PeopleSoft Cube Manager*, "PeopleSoft Cube Manager Preface."

See Also

http://www.oracle.com/appserver/business-intelligence/essbase.html

Essbase Cube Builder Business Processes

The following process flow illustrates the Cube Builder business processes:



Essbase Cube Builder business process flow

Note. Oracle Essbase, SmartView, and other Oracle Hyperion tools are not delivered as part of our application; therefore, the PeopleSoft Cube Builder PeopleBook does not include documentation about how to use Oracle Hyperion applications. It does, however, include a reference to the appropriate documentation.

See Also

http://www.oracle.com/appserver/business-intelligence/essbase.html

Other Sources of Information

This section provides information to consider before you begin to use PeopleSoft Cube Builder.

Take advantage of all PeopleSoft sources of information, including the installation guides, release notes, PeopleBooks, red papers, the Updates and Fixes area of My Oracle Support, and curriculum courses of Oracle PeopleSoft.

See "PeopleSoft Cube Builder Preface," page vii.

See *PeopleTools 8.51 PeopleBook: Getting Started with Enterprise PeopleTools.*

Essbase Cube Builder Implementation

Essbase Cube Builder implementation can be divided into the following phases:

- Designing cube metadata.
- Defining connection definitions.

- Creating dimensions.
- Creating an outline.
- Building cubes.

Designing Cube Metadata

The initial phase for creating cubes is to define their metadata, that is, the data that describes the cube structure. You can define metadata with either PeopleSoft trees or queries. To design cube metadata, perform the following steps:

Step	Reference
Create new trees or use existing trees.	See *PeopleTools 8.51 PeopleBook: PeopleSoft Tree Manager*, "Using PeopleSoft Tree Manager" and *PeopleTools 8.51 PeopleBook: PeopleSoft Tree Manager*, "Creating Trees."
Create new queries or use existing queries.	See *PeopleTools 8.51 PeopleBook: PeopleSoft Query*, "Creating and Running Simple Queries," Creating New Queries.

Defining Connection Definitions

The second phase of creating Essbase cubes is to create connectivity information. To set up the Essbase server connection information, perform the following step:

Step	Reference
Define Essbase Cube Builder connection definitions.	See Chapter 3, "Defining Essbase Cube Builder Connection Definitions," page 21.

Creating Dimensions

Dimensions are equivalent to fields in a relational database. In data analysis terms, dimensions can be thought of as criteria that are used to pinpoint a particular piece of data, for example, time, account, and salesperson. Dimensions are subdivided into categories called members; for example, the time dimension contains the members 2007, 2008, 2009. You can add members to dimensions manually; members are populated by the results of a PeopleSoft Query or populated from a PeopleSoft Tree structure.

To create dimensions, perform the following steps:

Step	Reference
Set up cube dimension builder.	See Chapter 4, "Creating Dimensions for Essbase Cubes," page 25.
Create Essbase dimensions.	See Chapter 4, "Creating Dimensions for Essbase Cubes," Creating Essbase Dimensions, page 27.

Creating an Outline

To create an outline, you group dimensions together to define the cube structure, and then you define the data queries that will be used to populate the cube.

To create an outline, perform the following steps:

Step	Reference
Define cube outlines.	See Chapter 5, "Defining Essbase Cube Outlines," page 53.
Add cube dimensions to a cube outline.	See Chapter 5, "Defining Essbase Cube Outlines," Adding Cube Dimensions to a Cube Outline, page 54.
Add cube data queries to a cube outline.	See Chapter 5, "Defining Essbase Cube Outlines," Adding Cube Data Queries to a Cube Outline, page 60.

Building Cubes

The last phase of Essbase Cube Builder implementation is sending all of the defined information—cube structure and data—to the Essbase server using the Create Cube component, which runs the Process Scheduler.

To build Essbase cubes, perform the following step:

Step	Reference
Build Essbase cubes.	See Chapter 7, "Building Essbase Cubes," page 73.

Chapter 2

Designing Cube Metadata

This chapter provides overviews of cubes, PeopleSoft metadata, metadata types, Oracle Essbase properties, and PeopleSoft Process Scheduler Integration, and discusses how to:

- Use trees.
- Create queries.

See Also

PeopleTools 8.51 PeopleBook: PeopleSoft Tree Manager, "Using PeopleSoft Tree Manager"

PeopleTools 8.51 PeopleBook: PeopleSoft Query, "Creating and Running Simple Queries"

Understanding Cubes

The key concept of online analytical processing (OLAP) is that of a cube. In this document, we use the term *cube* to refer to any analytic data store. An OLAP cube is a collection of related data—a database—that has multiple dimensions. The term *cube dimensions* roughly describes the equivalent of fields in a relational database. In terms of data analysis, dimensions can be thought of as criteria—such as time, account, and salesperson—that can pinpoint a particular piece of data. These pieces of data are usually transactions from an online transaction processing (OLTP) system.

Although they are called cubes, OLAP databases can have more than three dimensions. In fact, most cubes have three to eight dimensions. To understand the concept of OLAP cubes, start with a simple data analysis model and then expand it.

Suppose you want to analyze unit sales of your company. You can examine the total units that were sold in a particular year, but that number might not help you understand much about your business. Instead, you might want to see unit sales broken down by time and by product. The matrix that you use to analyze this data might look like the following table, which represents a cube with two dimensions (time and product):

Product	***2001***	***2002***	***2003***
Widgets	3000	6500	8200
Gadgets	1200	1450	3000

Product	*2001*	*2002*	*2003*
Doohickeys	2500	3400	2000
Whatzits	500	670	1300

Dimensions and Members

In OLAP terminology, the preceding table is an OLAP cube that represents units sold dimensioned by time and product. Time and product are the dimensions of the cube, and units sold is the fact data.

In the preceding table, each dimension is subdivided into categories, called *cube members*, which represent individual years and products.

- In the time dimension, the members are 2001, 2002, and 2003.
- In the product dimension, the members are widgets, gadgets, doohickeys, and whatzits.

Measures and Cells

In the preceding table, the values of the most interest are not years or products. The purpose of the table is to find the number of units that were sold. Sold units make up the data element that is being evaluated or measured. In OLAP terminology, the number of units sold is called the *measure*, or *fact*, of this cube. The areas of the table where members intersect with other members represent individual measure and fact values. These intersections are called *cells*. The italicized cell in the preceding table represents the number of widgets sold in 2002: 6500 units.

Multiple Dimensions

The two-dimensional cube represented by the preceding table is basic for reporting purposes. For example, it does not provide data about where any of the units were sold. You can provide this information by adding another dimension, *location*, to the model, as shown in this diagram:

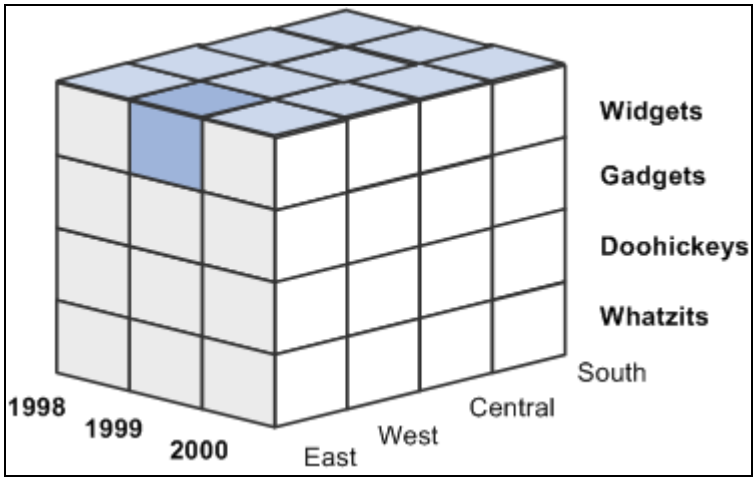


Diagram of a cube with three dimensions

The preceding three-dimensional OLAP cube represents units sold dimensioned by time, product, and location. (The location members are East, West, Central, and South.) The shaded cell represents the number of widgets sold in the East region in 1999. You could find the number of units sold for any other product in any other region at any other time by finding the cell at the intersection point of three members, one from each dimension.

Suppose you also want to factor customer accounts into the analysis. Although showing four dimensions graphically is a challenge, the result of this added dimension is clear: in our example, each cell of the OLAP cube represents the intersection of an account, a year, a region, and a product.

Hierarchy

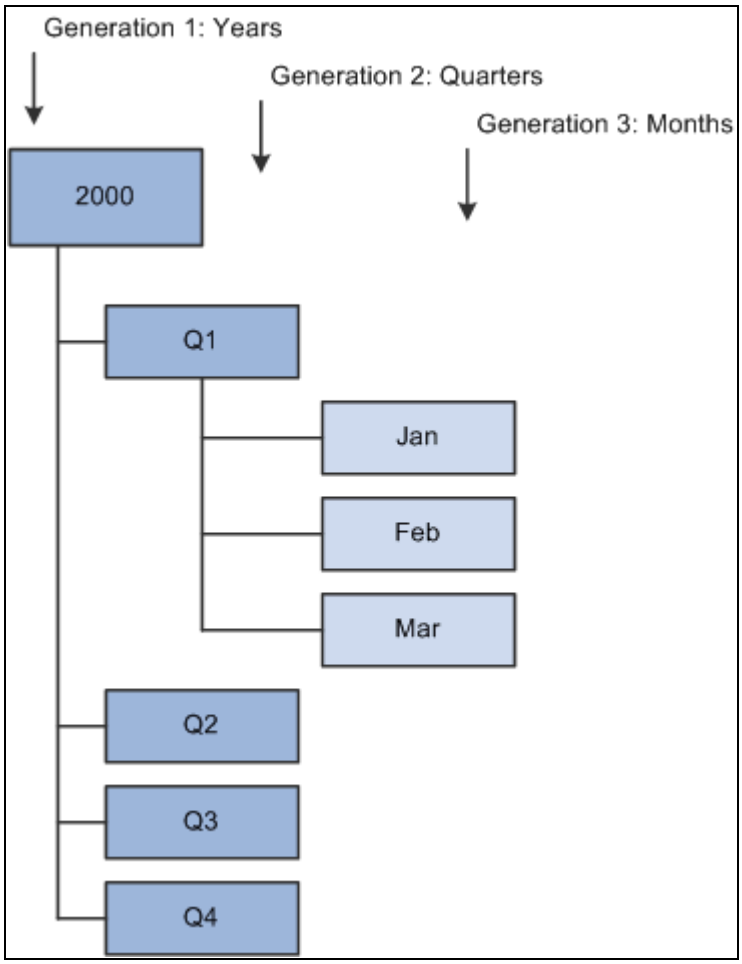
Hierarchy is the organization of cube data elements with their reporting structures. It represents both the hierarchy and the method of consolidation in a dimension level.

The example cube has only one level in each dimension. The time dimension consists of one level containing three members (years), and the location dimension consists of one level containing four members (regions). However, the data used to build such OLAP cubes probably supports more than just one level in each dimension.

For example, when a company records a sale, that sale occurs in a particular month, which occurs in a particular quarter and in a particular year. You can examine the time dimension at one of three levels: month, quarter, or year. Likewise, you can record that each sale occurs in a particular office, in a particular city, or in a particular region. The location dimension might also have three levels, such as office, city, and region.

As mentioned, the categories found at each level of a dimension are called members. You can envision multilevel dimensions as tree diagrams, the members of which relate to each other in various parent-child relationships. Some members are parents of other members, some are children, and some are both.

This diagram shows an example of a portion of a typical time dimension with its various levels and members:



Example of a time hierarchy diagram

Each box in the diagram represents a unique member. This diagram is familiar to PeopleSoft Tree Manager users. In fact, PeopleSoft trees can play an important role in defining the hierarchy of an OLAP cube.

See *PeopleTools 8.51 PeopleBook: PeopleSoft Tree Manager*.

Consolidation

Viewing the dimension of a hierarchy tells you about the organization of its members, but you should consider another facet of the dimension. You need to know how to consolidate the values that are found under child members into the value of their parent members. For example, the children might be added together to equal the parent. This scenario is certainly the case in a time dimension, in which the value for each member is added to its siblings to equal the value of its parent. (Three months can be consolidated into their parent quarter, four quarters can be consolidated into their parent year, and so on.)

This table shows the cube example, adding a second level, quarters, to the time dimension of the original example:

Product	2001 Q1	2001 Q2	2001 Q3	2001 Q4	2002 Q1	2002 Q2	2002 Q3	2002 Q4	2003 Q1	2003 Q2	2003 Q3	2003 Q4
Widgets	400	700	950	400	1200	980	995	975	2200	990	750	500
Gadgets	300	300	300	300	300	300	400	450	600	650	850	900
Doohickeys	600	600	700	600	750	850	950	850	750	400	300	550
Whatzis	125	125	125	125	125	200	225	120	170	230	400	500

Consolidation example in tabular format

To consolidate the data at the quarterly level into the yearly level, the quarterly data is added together. The 2001 rollup is `Q1 2001 + Q2 2001 + Q3 2001 + Q4 2001`.

However, you also might find dimensions in which certain members are to be subtracted from their siblings, such as in a profit dimension. In such a dimension, suppose two members are at the first level, margin and total expenses, both of which are reported as positive values. To find the total profits, you would not add margin and total expenses, instead you would subtract total expenses from margin.

Understanding PeopleSoft Metadata

Metadata is data that defines data. Metadata conveys information about how data is formatted, structured, and stored. In an OLAP cube, metadata defines dimensions, levels, members, member attributes, and interrelationships of the cube. PeopleSoft Cube Manager uses two types of PeopleSoft structures, trees and queries, to define cubes.

PeopleSoft Trees

A PeopleSoft tree defines the summarization rules for a database field. It specifies, for purposes of reporting or security access, how the field values are grouped in the system.

For example, the values of the DEPTID field might identify individual departments in your organization. You could build a tree for the DEPTID field, which defines the organizational hierarchy that specifies how each department relates to the others: departments 10700 and 10800 report to the same manager, department 20200 is part of a different division, and so on.

You can easily see how you can use PeopleSoft trees to define a cube structure. Like cube dimensions, trees consist of levels and members. (In PeopleSoft Tree Manager, members are called *nodes* and *leaves.*)

See *PeopleTools 8.51 PeopleBook: PeopleSoft Tree Manager.*

PeopleSoft Queries

PeopleSoft queries are SQL statements that are created by PeopleSoft Query. You can use these SELECT statements to return field values based on certain criteria. The standard PeopleSoft security mechanism can secure the data returned by PeopleSoft Query. Also, PeopleSoft Query can return data in any of the database-supported globalized formats.

You can use queries in a number of ways to define an OLAP cube. Finally, you can use queries to populate OLAP cubes with data; the query results are the rows of data that fill the cells of the cube.

See *PeopleTools 8.51 PeopleBook: PeopleSoft Query.*

Understanding Metadata Types

Three types of metadata are available that define an OLAP cube:

- Dimensional metadata (hierarchy and members)
- Member property metadata (consolidation method, sign flip, and label)
- Cube metadata (dimensions and measures)

You use PeopleSoft Tree Manager and PeopleSoft Query to describe all of this metadata to PeopleSoft Cube Manager.

Understanding Oracle Essbase Properties

Oracle Essbase has the following valid property types:

- Data storage

  Data storage enables Essbase to recognize what type of storage to allocate for the member. Valid values are *0* or *blank* (store data), *1* (never share), *2* (label only), *3* (shared member), *4* (dynamic calculation and store), and *5* (dynamic calculation, no store).

  PeopleSoft Cube Manager sets the default value as store data for all members in the first rollup and the non-detail nodes of all other rollups. Detail nodes in secondary rollups are set to shared members.

- Expense item

  Expense item applies to account dimensions only. Essbase has certain built-in formulas that can take advantage of the knowledge that an item is an expense. To pass this knowledge on to Essbase, you should use this property. Valid values are *Blank* (set) and *non-Blank* (do not set).

- Time balance

  Time balance affects how the parent time value is calculated. Valid values are *0, 1, 2,* and *3,* which correspond to none, first, last, and average, respectively.

- Consolidation

  This property enables you to define the mathematical operator used for rolling up members. Most often, you expect that data is added (using the + operator) when rolled up. However, you might occasionally need to specify other operators, such as those listed in the following table:

Valid Value	***Action***
+ (plus sign)	Add (default).
– (minus sign)	Subtract.

Valid Value	*Action*
* (asterisk)	Multiply.
/ (forward slash)	Divide.
[Blank]	Do not consolidate.
~ (tilde)	Do not consolidate.
% (percent sign)	Divide the total of previous member calculations by this member and multiply by 100.

See Also

Oracle Essbase and Cognos PowerPlay Services documentation.

Understanding PeopleSoft Process Scheduler Integration

PeopleSoft Process Scheduler includes a process type definition specifically for use with PeopleSoft Cube Builder. This process type is the Cube Builder process type, and you invoke it whenever you launch the process to create a cube from the standard run control page. During this process, the data and metadata are translated into a format that is understood by Oracle Essbase.

See Also

PeopleTools 8.51 PeopleBook: PeopleSoft Cube Manager, "Building Cubes," Defining a Cube Build Process Using Process Scheduler Manager

Using Trees

Metadata that exists in PeopleSoft trees can be particularly useful when you design cube dimensions. The main reason to use an existing tree is to leverage the rules that are associated with the outline that the tree represents. Because trees are used to validate information that is stored in the OLTP database, all of that tree information is already related to the transactional data. Using effective-dated trees in an outline generates the automatic evolution of your data that is used for data analysis.

PeopleSoft Cube Manager leverages the information that is already stored in your PeopleSoft trees as outlines upon which to build each dimension. Using the Dimension page in Essbase Cube Builder, you map a tree to a dimension so that the rollup of the resulting cube dimension is the same as that of the specified tree.

By default, data is summarized exactly as the tree is defined. Each node and detail value becomes a member of the cube hierarchy for that dimension. The descriptions of the nodes and details become the labels, or aliases, of the members.

You might want to use existing trees for your dimensions, or you might need to create new trees. If you have an existing tree that is close to what you want the dimension to look like, make a copy of the tree and modify that copy.

If the hierarchy that you want to use is a subset of an existing tree, you do not have to create a new tree. PeopleSoft Cube Builder enables you to use a subset of an existing tree by specifying a starting node, Top Node, and the number of levels below the top node of the tree to include in the hierarchy. You can use more than one tree belonging to the same business unit to define a single hierarchy.

In addition, if a tree does not provide the structure that you need for a dimension, you can add members, attributes, and generations by using one or more queries to provide the additional metadata.

PeopleSoft Cube Manager treats uppercase and lowercase characters as distinct, so the names *ABC,Abc,* and *abc* are all considered unique member names. However, Oracle Essbase offers an option to change all member names to uppercase. If you enable this option, you create problems in PeopleSoft Essbase Cube Builder with members that are identical except for their letter casing.

Note. PeopleSoft Cube Manager permits duplicate node names if you cannot avoid the duplication.

In Essbase, a dimension can have multiple rollups. The resulting total for the first rollup is calculated differently from the resulting totals for subsequent rollups. For example, a dimension exists with two rollups. Two different trees are used for these two rollups: the first tree is set up as A, B, C and the second tree is set up as A, D, C.

Assume that A, B, C, and D have the following fact data values: 2, 5, 10, and 20 respectively. The total for the first rollup, A, B, C, is 17 because the total equals 2 + 5 + 10. The total for the second rollup, A, D, C, is 10 because each parent gets its total from its children. Because C has the fact value 10, the total for C is 10. Because D is the parent of C, D gets its total from its children. Therefore, D gets 10 from C. A gets its total from its children, which is D. Therefore, A has the total value of 10.

See Also

PeopleTools 8.51 PeopleBook: PeopleSoft Cube Manager, "Designing Cubes," Designing a Cube

Creating Queries

This section provides an overview of query types and discusses how to:

- Use dimension queries.
- Use data source queries.

Understanding Query Types

You can create several types of queries to use with PeopleSoft Cube Builder, all of which you must define as user (ad hoc) queries rather than role queries or database agent queries.

See Chapter 2, "Designing Cube Metadata," Using Dimension Queries, page 13 and Chapter 2, "Designing Cube Metadata," Using Data Source Queries, page 13.

Using Dimension Queries

Dimension queries enable you to define the dimension structure using query results instead of, or in addition to, a tree. However, remember that you are using queries to create a tree-like structure.

You can convey hierarchical information by parent/child relationship or by a narrow query.

In PeopleSoft Cube Builder, dimension queries can be dynamic or static. A dynamic query indicates that any incremental change in the tables that the query uses are reflected in the next run of PS2Essbase. A static query indicates that further changes to the tables used to create the first hierarchy will not be reflected unless the hierarchy is reloaded manually.

PeopleSoft Cube Builder uses dynamic queries to populate members at the leaf levels of a hierarchy and under the same parent.

Using Data Source Queries

Data source queries define the data that you bring into the cube. Writing a data source query is straightforward; the query must return one column for each dimension and one column for the measure. Assume that you want to build a data source query for a cube containing amounts that are dimensioned by account, department, and period.

The output of your query has four columns, as shown in this table:

Account (Dimension)	***Department (Dimension)***	***Period (Dimension)***	***Amount (Measure)***
XXX	XXX	XXX	XXX
XXX	XXX	XXX	XXX

You can use several queries as the data source for a single cube, to load data into the measure. Every data source query that is used must include an output column for every dimension that is used and for the measure. In the version of the cube builder, only one measure is allowed per cube.

The following tables show examples of how you can use two separate queries as a data source for a cube. Note that both queries return columns for every dimension, as required, and that they differ only in which measure they include.

Results of Query 1:

Account (Dimension)	***Department (Dimension)***	***Period (Dimension)***	***Budget Amount (Measure 1)***
1000	DEV	Q4 2003	4000
1100	SALES	Q4 2003	6000

Results of Query 2:

Account (Dimension)	*Department (Dimension)*	*Period (Dimension)*	*Actual Amount (Measure 2)*
1000	DEV	Q4 2003	3000
1100	SALES	Q4 2003	5000

Resulting cube using Query 1 and Query 2 as data sources:

Account (Dimension)	*Department (Dimension)*	*Period (Dimension)*	*Budget Amount (Measure 1)*	*Actual Amount (Measure 2)*
1000	DEV	Q4 2003	4000	3000
1100	SALES	Q4 2003	6000	5000

Incremental Updates

Two types of incremental updates are available:

- Metadata

  Incremental updates for metadata refers to the addition, removal, or modification of dimension members and/or their properties.

- Data

  Incremental updates for data refers to the aggregation of delta values to the cube data cells product of dimensional intersections of members.

Data Cell Types

By default, two categories of data cells are available for incremental data updates:

- Calculated data cells (or non-leaf nodes)

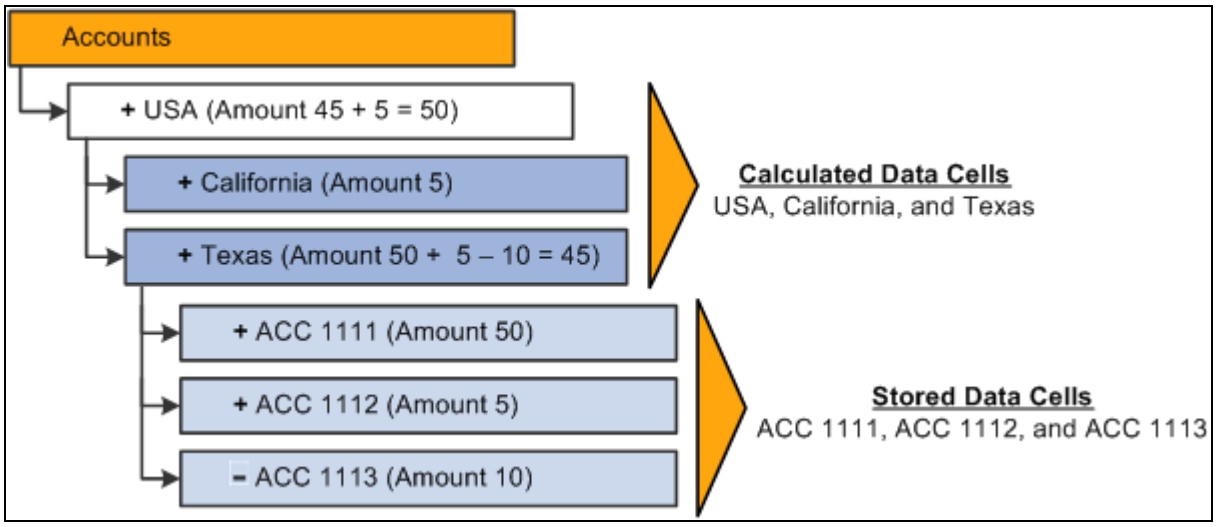
  Calculated data cells store values of dimensional intersections of non-level zero members (branch nodes), which are calculated based on the consolidation properties of their children.

- Stored data cells (or leaf nodes)

  The stored data cells store values of dimensional intersections of level zero members (leaves) assigned manually.

Note. You can modify the stored properties, calculated properties, or both on any member at any level.

This example shows how to create data queries for incremental updates, taking as a reference the next Accounts dimension:



Example of how to calculate upper data cells based on stored data cells

Aggregations on Load Tool

Essbase uses the term *Aggregations on Load* (replace/add/subtract) as *incremental updates for stored data cells.* Essbase supports three data Aggregations on Load options:

- Replace current value

  Use the *Replace* option to overwrite or replace the currently stored value in the data cell with the value being passed. Basically, if the data file has multiple rows with the same dimensional intersection, then the last value in the data cell is stored and the previous ones are ignored.

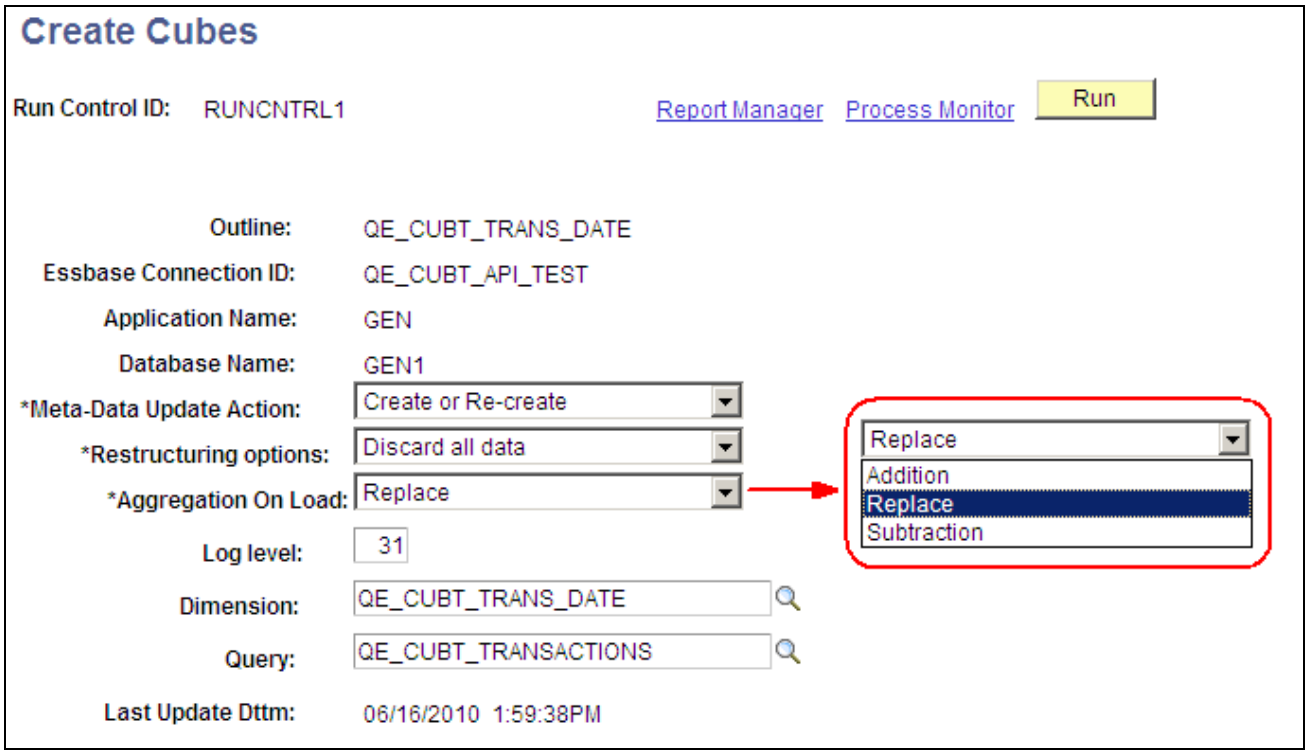
- Add to existing values

  Use the *Add* option to add all the values for the stored data cell to the currently stored value. Use this option for instances in which loads are always additive, for example, an implementation that loads transactions to an already stored summary amount.

- Subtract from existing values

  Use the *Subtract* option as the opposite of the *Add* option. It subtracts the values passed from the currently stored value. This option is rarely used, but you can use it to perform an additive load that then needs to be backed out.

This example shows the aggregations on load options in the run control ID of the Create Cubes page:



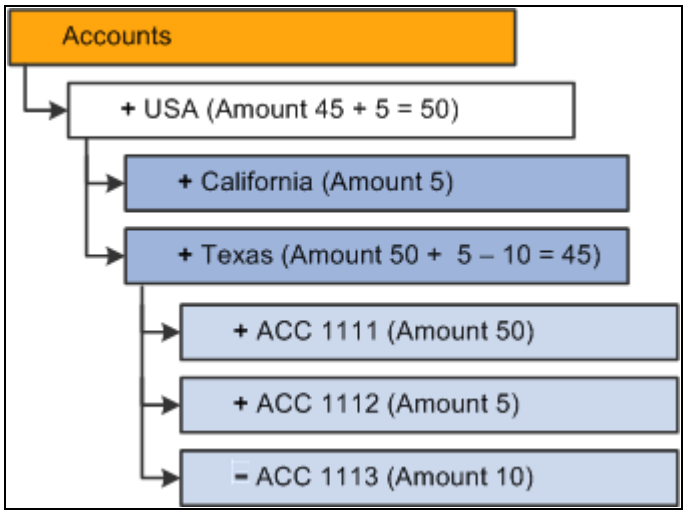
Create Cubes page with the Aggregations on Load options of Replace, Add, and Subtract

Note that:

- The aggregations on load options are ignored when only metadata (dimension) is built.
- When you build multiple factories (multiple data queries) in the same build, the same Aggregations on Load option is used for all of the factories.
- The default value of the Aggregations on Load field is *Replace*.
- After you run the PS2Essbase process, the Aggregations on Load option serially builds each dimension and then serially builds each factory. The factory creates a data file with all the data cells to be loaded to the Essbase server.

Example: Designing Data Queries for Incremental Updates

This example shows how to create data queries for each Aggregations on Load option, taking as a reference the next Accounts dimension:



Example of how to create data queries for each Aggregations on Load option, next Accounts dimension

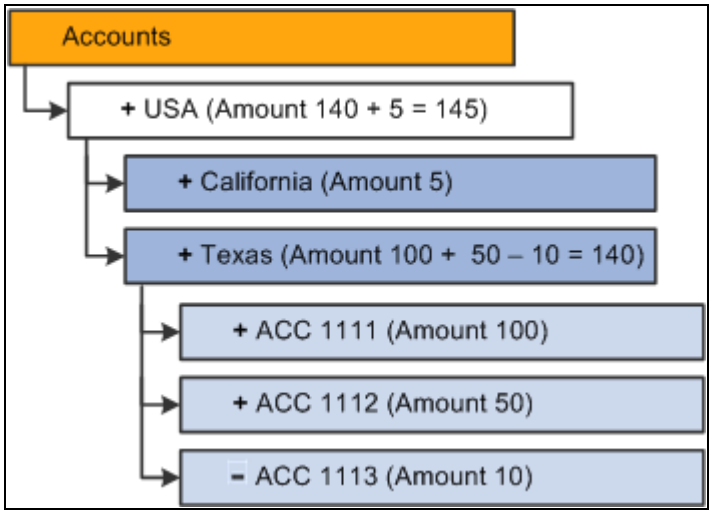
This example shows how to create data queries for each Aggregations on Load option, taking as a reference the next staging table that contains the data cells to be loaded:

Account	Amount
ACC 1111	$200
ACC 1111	$100
ACC 1112	$10
ACC 1112	$50

Example of how to create data queries for each Aggregations on Load option, next staging table

Essbase Cube Builder can be used to produce two different results:

1. If the *Replace* (replace data load) option is selected, this is the resulting dimension:



Results of replacing the existing data cells

Note. The last value passes for each cell is the valid value. In this example, cells ACC 1111 ($200) and ACC 1112 ($10) are ignored.

When you want to perform an additive incremental update using the *Replace*Aggregations on Load option, you need to create a data query that summarizes repeated fields into one field. For example, to achieve an additive incremental update on stored data cells, you need to create a data query that summarizes repeated fields into one field, as in this example:

Account	Amount
ACC 1111	$50 + $200 + $100 = $350
ACC 1112	$5 + $10 + $50 = $65

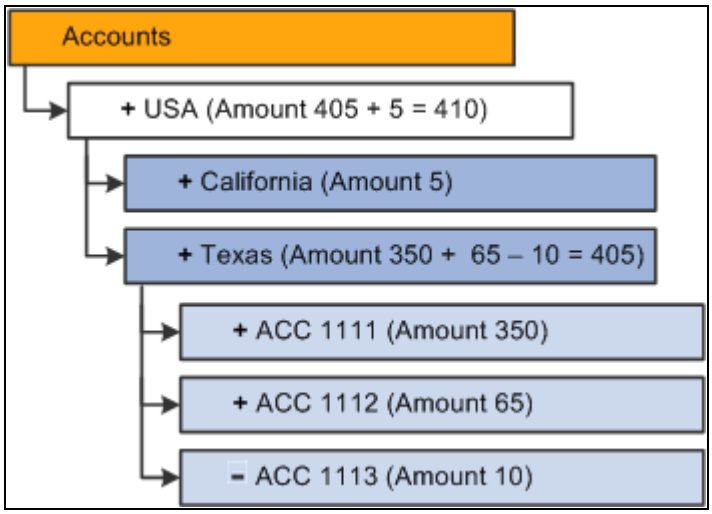
Example of summarizing repeated fields into one field

The SQL query is:

```
SELECT DISTINCT A.ACCOUNT,
      (
      SELECT SUM ( B.AMOUNT )
          FROM STAGING_TABLE B
          WHERE A.ACCOUNT = B.ACCOUNT
      )
FROM STAGING_TABLE A;
```

SQL query, summarizing repeated fields into one field

The resulting dimension is:

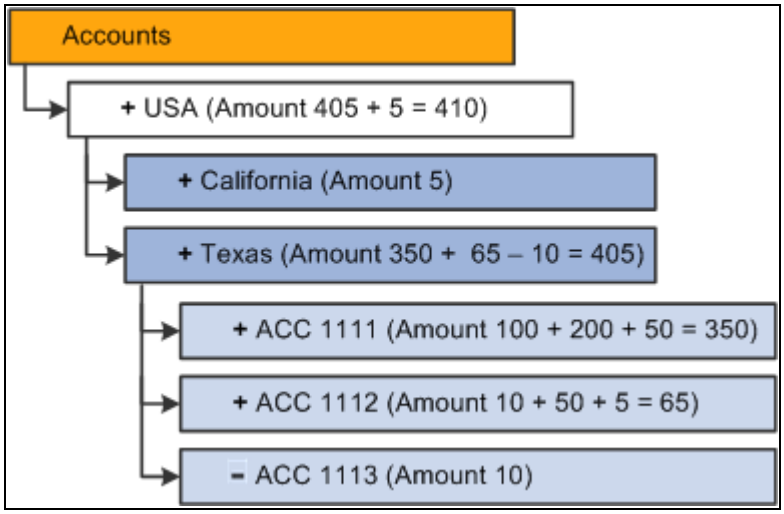


Results of replacing incremental updates

Note. The current stored value is overwritten and lost, therefore, in the staging table used for the data query loads, you must not eliminate the previous increments that are already loaded into Essbase. These previous increments are required to recalculate the total summarized amount in each load.

---

2. If the *Add* (addition data load) option is selected, this is the resulting dimension:



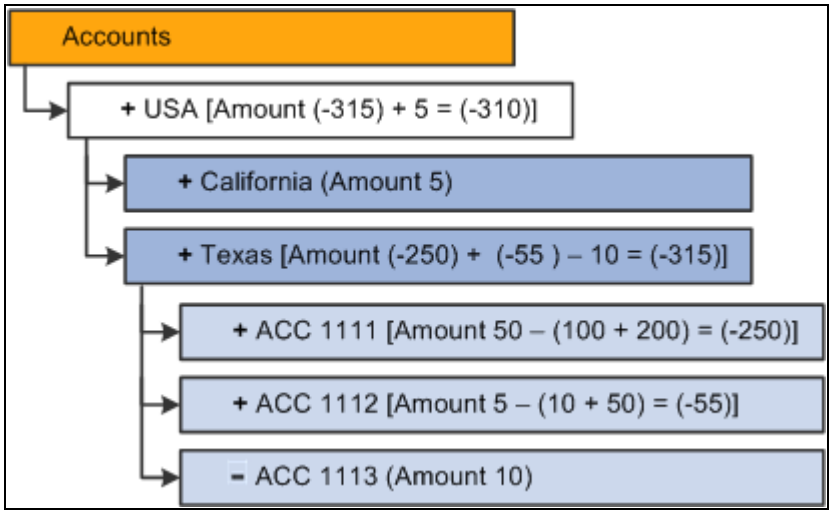
Results of additive incremental updates: the previously stored values plus each one of the new cells that corresponds to the cube intersection are added

---

Note. The resulting amounts in the dimension after the build is the same as when you want to perform an additive incremental update using the *Replace*Aggregations on Load option.

---

3. If the *Subtract* (subtraction data load) option is selected, this is the resulting dimension:



Results of subtractive incremental updates: the previously stored values minus each one of the new cells that corresponds to the cube intersection conforms to the result for the stored data cells

In almost all instances, *Replace* is the preferred option over *Add* and *Subtract* because *Replace* makes forming queries against relational sources easier (it summarizes data to the dimensional intersection versus having duplicate rows in the load file). The *Replace* option is also a better alternative because it reduces the number of records to be passed to Essbase, thus improving performance. Moreover, the *Add* and *Subtract* options make the recoverability more difficult after the database fails while loading the data. Although when a recover is required, Essbase lists the number of the last rows committed in the application event log file, which is used to restart the build process.

If you run the cube using the *Add* or *Subtract* options, you need to clear the staging table after each build so that the values that are already loaded is not required again. However, PeopleSoft Cube Builder does not modify or remove the loaded cells from the staging table; either you or the application that uses the Cube Builder is responsible for cleaning up the staging table after the incremental data is loaded. If the staging table is clear, the notification of the Process Scheduler shows that the cube building process runs successfully. To successfully clear the staging table, you should create a PSJob that first runs the PS2Essbase process and then runs another AE program to clear the specific staging table.

Note. PSJob and the AE program are not provided by PeopleTools.

Chapter 3

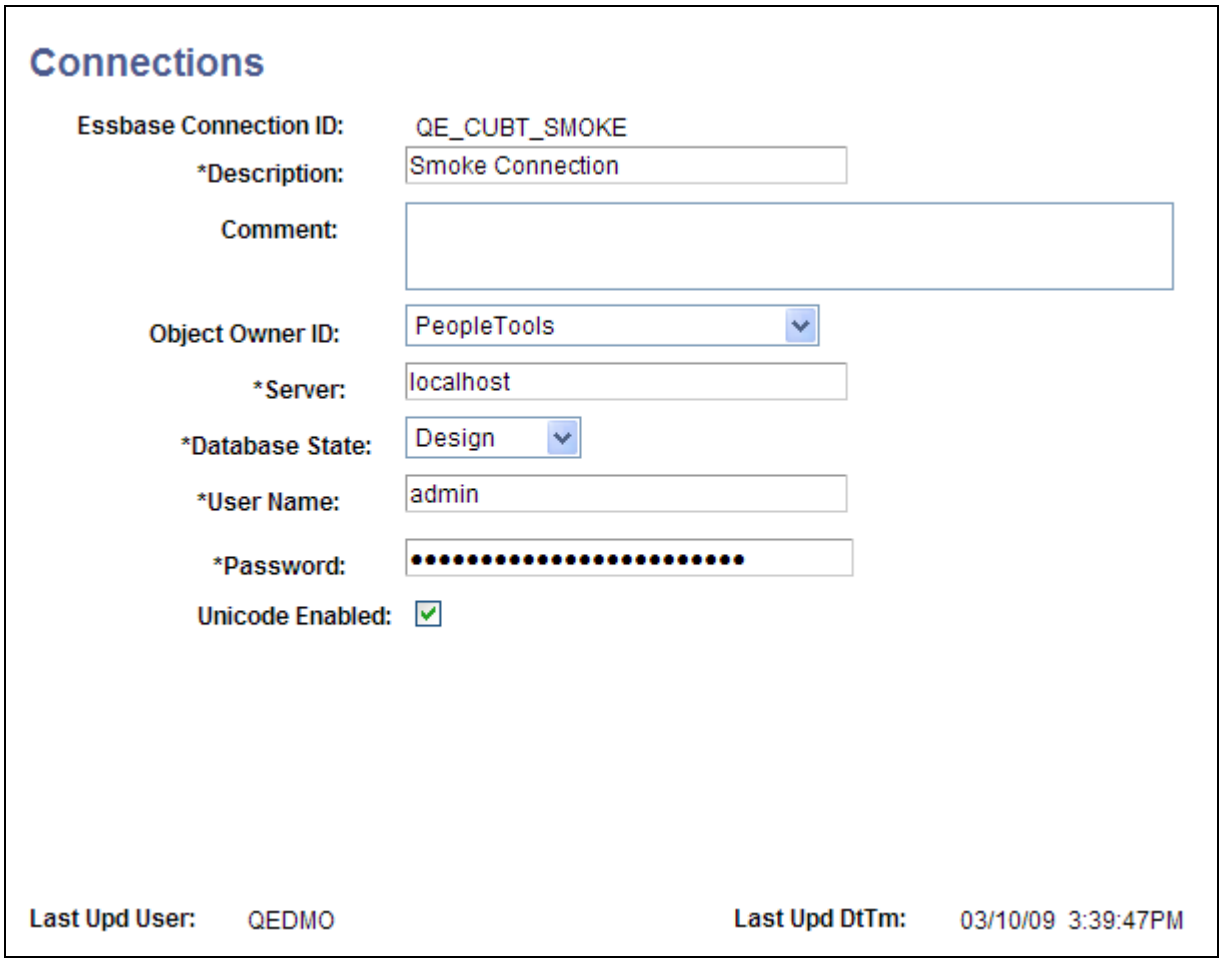
Defining Essbase Cube Builder Connection Definitions

This chapter discusses how to define Essbase Cube Builder connections.

Defining Essbase Cube Builder Connections

The first step in creating Essbase cubes is to create connectivity information using the Connections page (CUB_CONNECTID). The Connections page enables you to define all the connectivity information, including the server name, user access, user ID, and user password.

Access the Connections page by selecting PeopleTools, Cube Builder, Essbase Cube Builder, Connections.



Connections page

Object Owner ID Select the owner of the Essbase connection.

The owner ID helps to determine the product, feature, or application team that last made changes to this Essbase connection. The available options are:

- *Mobile Company Directory*
- *PeopleTools*
- *PeopleTools Demo*

Server Enter the Essbase network server name or IP address.

Database State Set the default user access level to the database after it is created or modified.

If explicit security is not granted in Essbase, then it applies to every user except the system administrator, to whom the User Name and Password options apply. The available options are:

- *Calculate*
- *Design*
- *None*
- *Read*
- *Write*

Oracle recommends that you set this option to *Read* at the least.

User Name Enter the Essbase user name.

Password Enter the Essbase password, which will be encrypted in the database table.

Note. Only users with the following permission lists are able to create the Essbase connectivity information: AEPNLS, ALLPAGES, CPPT1080, PTPT1200, and SMPPNLS.

Unicode Enabled Specify whether the database to be created will contain Unicode characters.

Note. Because selecting this option creates an Essbase Unicode database, the Essbase server must be in Unicode mode.

The Unicode Enabled check box on this page is not synchronized with the setting in the PSSTATUS table, which allows customers to override the Unicode setting in the PeopleSoft environment if desired.

Last Upd User (last update user) Displays the ID of the user who last modified the Essbase connection.

Last Upd DtTm (last update date and time) Displays the date and time the Essbase connection was last modified.

Chapter 4

Creating Dimensions for Essbase Cubes

This chapter provides an overview of Essbase Cubes dimensions and discusses how to:

- Set up cube dimension builder.
- Create Essbase dimensions.

Understanding Dimensions of Essbase Cubes

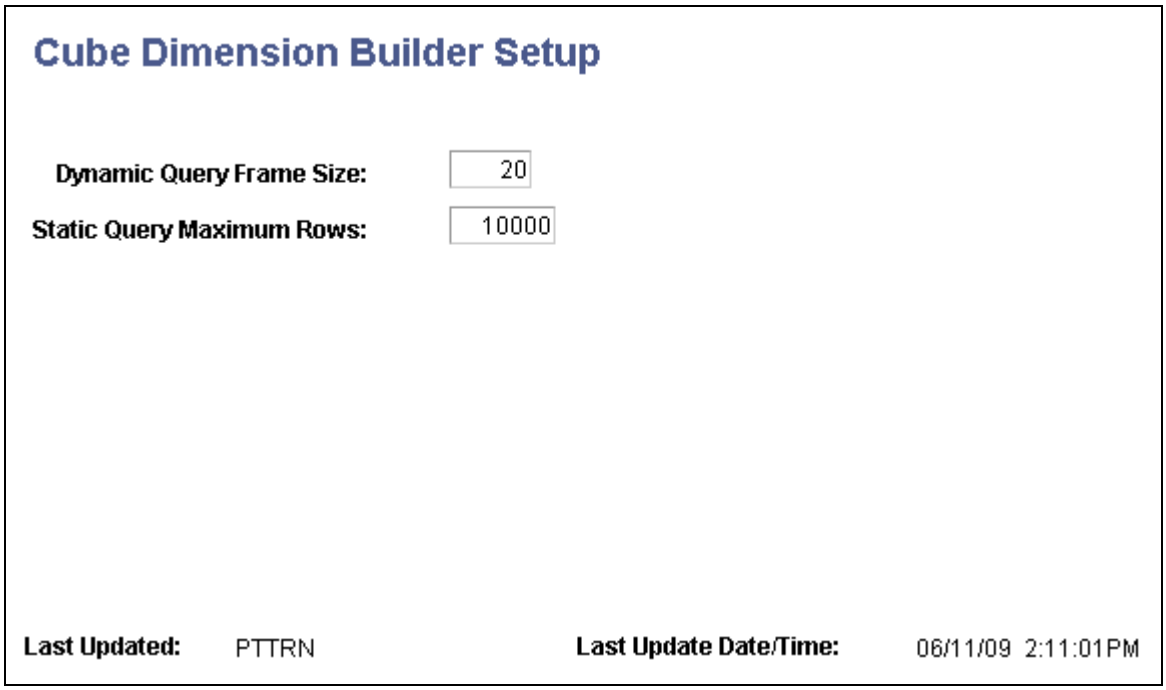
After creating an Essbase cube connection, you can create Essbase dimensions. Dimensions represent different aspects that are related to a multidimensional database. Typical dimensions are:

- A time dimension, which is used to map transactional information over a time period.
- An account dimension, which is used to map various affected accounts.
- A country dimension, which is used to map geographic transactional areas.

Groupings of dimensions make up a cube outline.

Setting Up Cube Dimension Builder

Access the Cube Dimension Builder Setup page (CUB_GUISETUP) by selecting PeopleTools, Cube Builder, Essbase Cube Builder, Cube Dimension Builder Setup.



Cube Dimension Builder Setup page

Use the Cube Dimension Builder Setup page to set values for the number of members to display at a time for dynamic queries, and to set the maximum number of rows to retrieve for static queries.

Dynamic Query Frame Size

Enter the number of items to show at a time for a dynamic query.

The dynamic query frame size controls the frame size for the dimension builder to use. This number can be set to any number from 10 to 1000. If the number of rows returned by a dynamic query exceeds this frame size number, then the dimension builder enters into chunking mode and displays a link to enable users to view the next and previous frame of the dynamic query.

Static Query Maximum Rows

Enter the maximum number of rows to be retrieved by the dimension builder when you run large static queries.

In general, you should avoid large static queries. Typically, when you build the structure of the dimension, entering the higher levels of the dimension manually—without queries or trees and with only the leaf values (level 0 members)—requires large queries. You should use dynamic for large queries.

For dynamic queries and trees, you cannot manually add more members so you would not typically use these queries or trees to create the higher order members of the dimension.

Last Updated

Displays the ID of the user who last modified the Essbase connection.

Last Update Date/Time

Displays the date and time that the Essbase connection was last modified.

Creating Essbase Dimensions

This section discusses how to:

- Define an Essbase dimension.
- Insert a tree structure into the dimension.
- Insert a query into the dimension.
- Define tine dimensions.
- Add generation names.

Pages Used to Create Essbase Dimensions

Note. Only users with these permission lists are able to create Essbase dimensions: AEPNLS, ALLPAGES, CPPT1080, PTPT1200, and SMPPNLS.

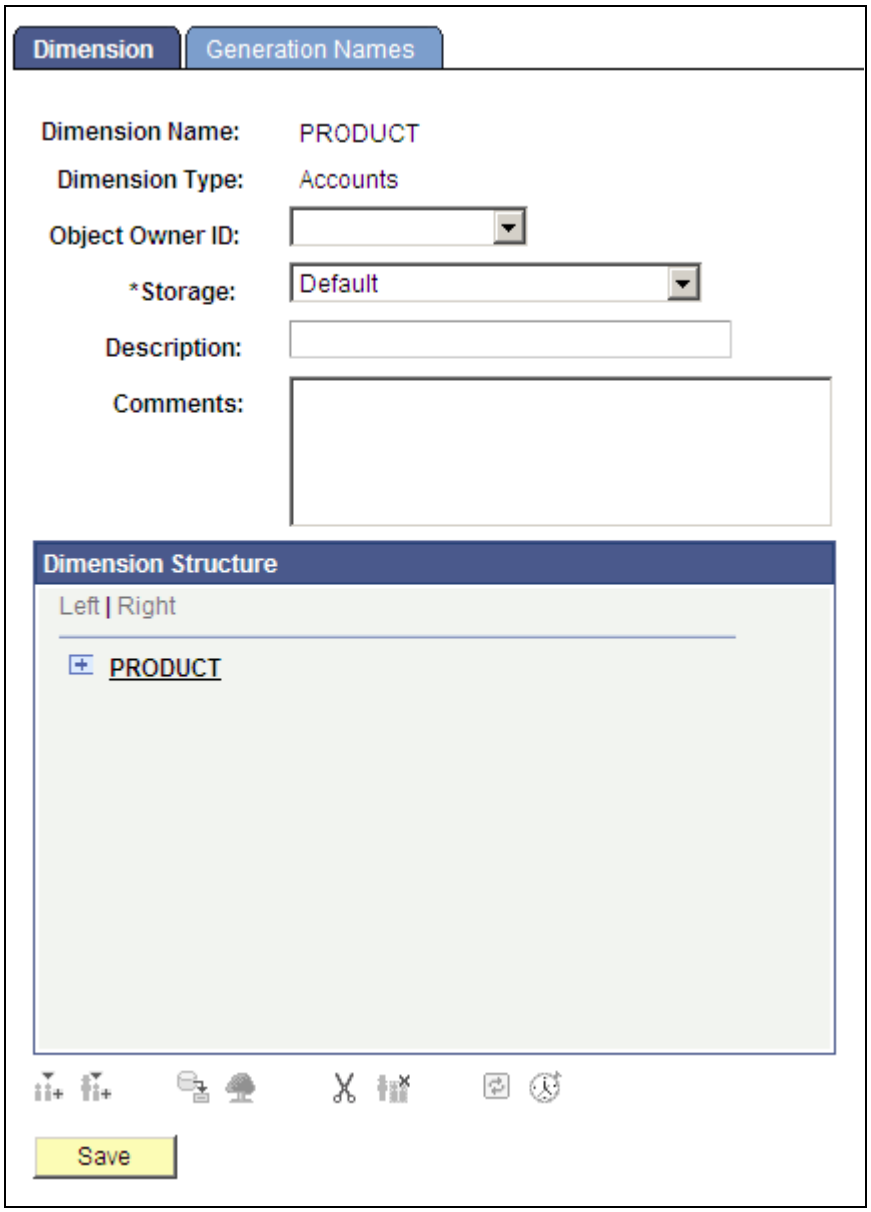
Page Name	*Definition Name*	*Navigation*	*Usage*
Dimension	CUB_DIMENSION	PeopleTools, Cube Builder, Essbase Cube Builder, Dimensions	Define an Essbase dimension.
Child Member Add	CUB_DIMENSION_SEC	PeopleTools, Cube Builder, Essbase Cube Builder, Dimensions On the Dimension page, highlight a tree member, and click the Add Member Child icon.	Use on initial member creation to enter the initial dimension name and consolidation operator. Add a new member that is a child of the currently highlighted tree member.
Member Formula	CUB_FORMULA_SEC	PeopleTools, Cube Builder, Essbase Cube Builder, Dimensions On the Dimension page, click the Formula link.	Enter formula information for a dimension member.
Find Tree	CUB_TREESEARCH_SEC	PeopleTools, Cube Builder, Essbase Cube Builder, Dimensions On the Dimension page, click the Assign From Tree icon.	Search for and select a tree that is defined in the system.

Page Name	*Definition Name*	*Navigation*	*Usage*
Select Top Node	CUB_TREENODE_SEC	PeopleTools, Cube Builder, Essbase Cube Builder, Dimensions On the Dimension page, click the Assign From Tree icon. On the Find Tree page, select trees and click the OK button.	Select an existing node of a highlighted tree.
Find Query	CUB_QRYSEARCH_SEC	PeopleTools, Cube Builder, Essbase Cube Builder, Dimensions On the Dimension page, click the Assign From Query icon.	Select a query that is defined in the system.
Select a Column	CUB_QRYCOLUMN_SEC	PeopleTools, Cube Builder, Essbase Cube Builder, Dimensions On the Dimension page, click the Assign From Query icon. On the Find Query page, select queries and click the OK button.	Select an existing column of a highlighted query. The columns displayed are from the select statement of the query.
Time Dimension Wizard	CUB_TIMEDIMWIZ	PeopleTools, Cube Builder, Essbase Cube Builder, Dimensions On the Dimension page, select the Time Dimension Wizard icon.	Define the date and time ranges of the time dimension.
Generation Names	CUB_DIMENSION2	PeopleTools, Cube Builder, Essbase Cube Builder, Dimensions On the Dimension page, select the Generation Names tab.	Enter the generation names for the Essbase dimension.

Defining an Essbase Dimension

Access the Dimension page by selecting PeopleTools, Cube Builder, Essbase Cube Builder, Dimensions.

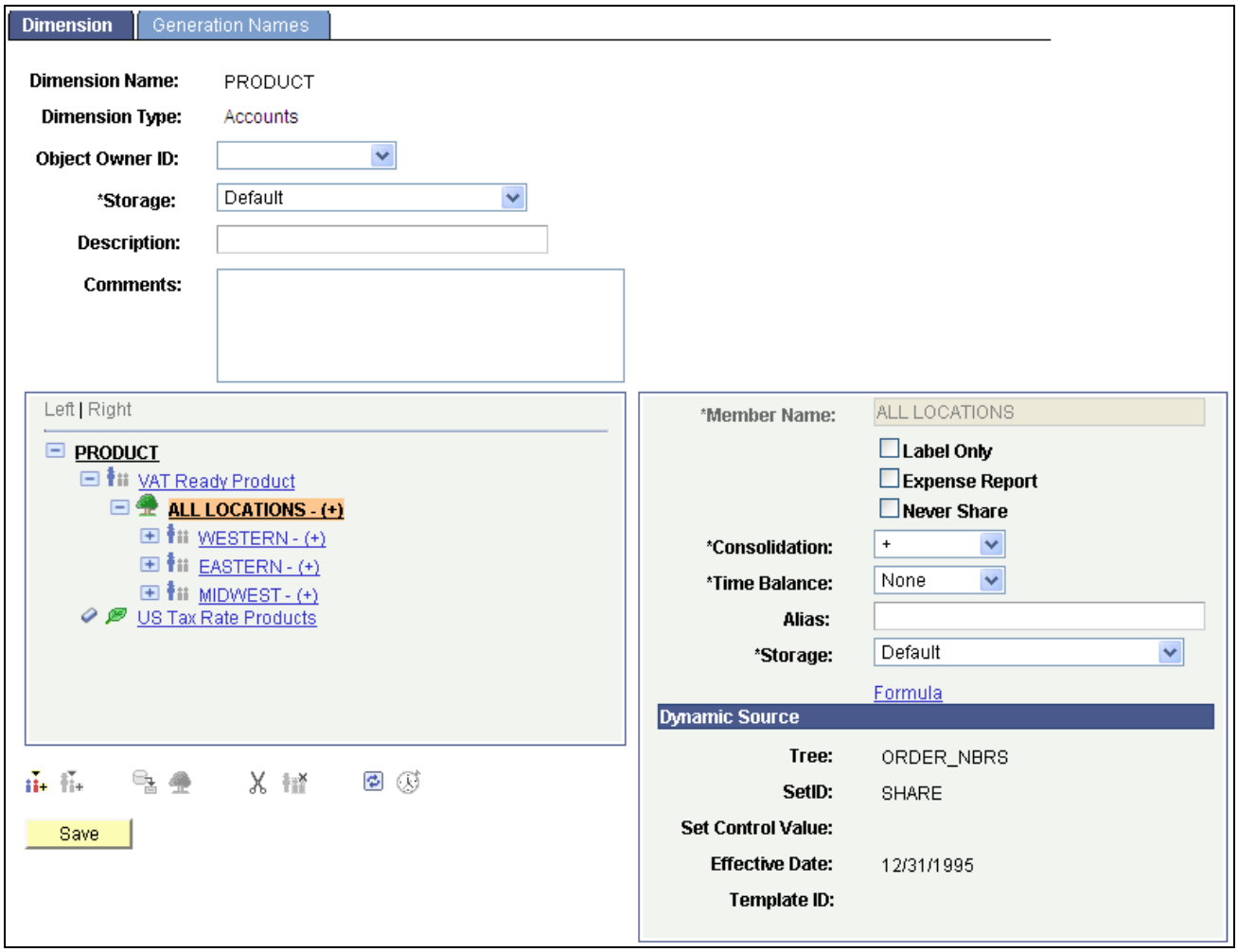
This is an example of the Dimension page when you first access it to create a dimension:



Dimension page when you first access it to create a dimension

When you first access the Dimension page to create a dimension, this page displays dimensional properties and a blank tree-like structure with a root node that has the same name as the dimension; most of the action icons at the bottom are disabled. Later on, depending on the Dimension Type value, the tree object members may or may not have all of the available properties that are shown in the following example. Action icons appear available as they become relevant when you build the dimensional structure.

This is an example of the Dimension page with some properties and active icons:



Dimension page

Dimension Type The system displays the type of the dimension. Available options are:

- *Accounts*
- *Country*
- *Date-time*
- *None (or Standard)*
- *Time*

Object Owner ID Select the owner of the dimension.

The owner ID helps to determine the product, feature, or application team that last made changes to this dimension.

Storage

Select from the following storage options:

- *Default*
- *Dynamic Calc*
- *Dynamic Calc and Store*
- *Never Share*
- *Label Only*

<Tree-like structure section>

Displays dimension data graphically to show a tree hierarchy.

The Insert Member Peer icon is available when you highlight a tree member.

Click this icon to add a new member that is a peer of the currently highlighted member.

The Add Member Child icon is available when you highlight a tree member *if* the current member can have children.

Click this icon to add a new member that is a child of the currently highlighted member.

Click the Assign From Query icon to run a public query. The results of running the query will be placed directly under the currently highlighted member.

You can select which query to run, and you need to supply any prompt values that the query requires. You need to supply the column of the query to use to populate the child members, which will be created when the query is run. You also can select the query to be run in dynamic mode. The query must return at least one row of data or it is considered invalid and is not used.

Click the Assign From Tree icon to copy a tree structure into the dimension.

Select the starting node of the tree; the system copies the selected node and all of its children. The currently highlighted node becomes the selected tree top node, and the member name of the current node is changed to reflect this selection. As with queries, you can select to have the tree copy be dynamic.

Click the Delete Member icon to delete dimension (children) members.

Click the Delete All Children icon to delete all query or tree children.

Click the Reset Values icon to clear or refresh member override values, if any, that you have entered for dynamic trees and queries.

Note. This icon is used for dynamic queries and trees when the concept of member overrides and templates is defined. This clearance is important if you have changed a template and want to reset all previously saved values.

Click the Time Dimension Wizard icon to access the Time Dimension Wizard page, where you can automatically populate the members of a time dimension.

Note. The Time Dimension Wizard icon is available only for the time dimensions and not for other dimension types.

Member Name

Enter the name or identifier of the member.

Label Only

This option is available only for child members, which are not at level 0.

Select to enable the system to group members together (with a dummy parent member) and enable easier access to the report.

Note. If you define a parent member as label only, the system does not calculate parent member from its child and reserves no storage space for that parent member. Use the default calculations for parent members to save time and storage space.

When you view the report in Microsoft Excel, the label-only member shows its first child value and does not occupy any storage space.

Expense Report

Expense item applies to account dimensions only. Essbase has certain built-in formulas that can take advantage of the knowledge that an item is an expense.

Select this check box to pass this knowledge on to Essbase. Valid values are *Blank* (set) and *non-Blank* (do not set).

Shared Member

Select to share values between members.

Never Share

Select to not allow members to be shared implicitly.

Note. Members that are set as Never Share can only be explicitly shared. To explicitly share a member, create the shared member with the same name and set it as *shared.*

Consolidation

This property enables you to define the mathematical operator used for rolling up members. Most often, you expect that data is added (using the + operator) when rolled up. However, you might occasionally need to specify other operators. The available operators are:

- *%* (percent sign): Divide the total of previous member calculations by this member and multiply by 100.
- * (asterisk): Multiply.
- + (plus sign): Add.
- – (minus sign): Subtract.
- / (forward slash): Divide
- ~ (tilde): Do not consolidate.
- [Blank]: Do not consolidate.

Time Balance

Time balance affects how the parent time value is calculated. Select from these values:

- *0*: none
- *1*: first
- *2*: last
- *3*: average

Alias

Add a custom alias for the member.

Storage

Data storage enables Essbase to recognize what type of storage to allocate for the member. Select from these values:

- *0* (or blank): store data.
- *1*: never share.
- *2*: label only.
- *3*: shared member.
- *4*: dynamic calculation and store.
- *5*: dynamic calculation, no store.

Formula

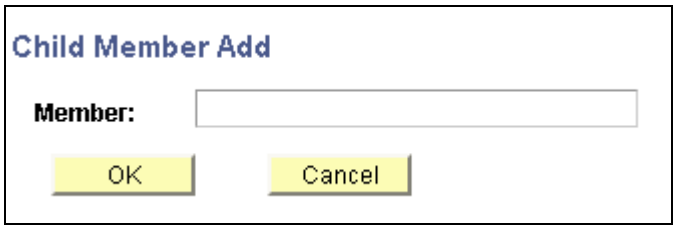
Click to access the Member Formula page, where you can enter formula information for a dimension member.

Dynamic Source If you select a dynamic query or dynamic tree member of the dimensional structure, the attributes on the right also display the dynamic object key values that were used in creating the entries:

- For a query, this section displays the query name that was used and if a particular template was used.
- For a tree, this section displays the tree name and the key values of the tree.

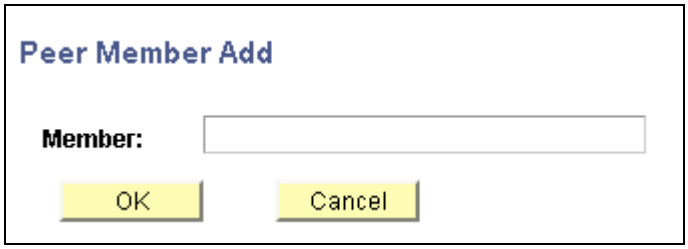
Adding a Child or a Peer Member

Access the Child Member Add page (on the Dimension page, highlight a tree member and click the Add Member Child icon).



Child Member Add page

Access the Peer Member Add page (on the Dimension page, highlight a tree member and click the Insert Member Peer icon).



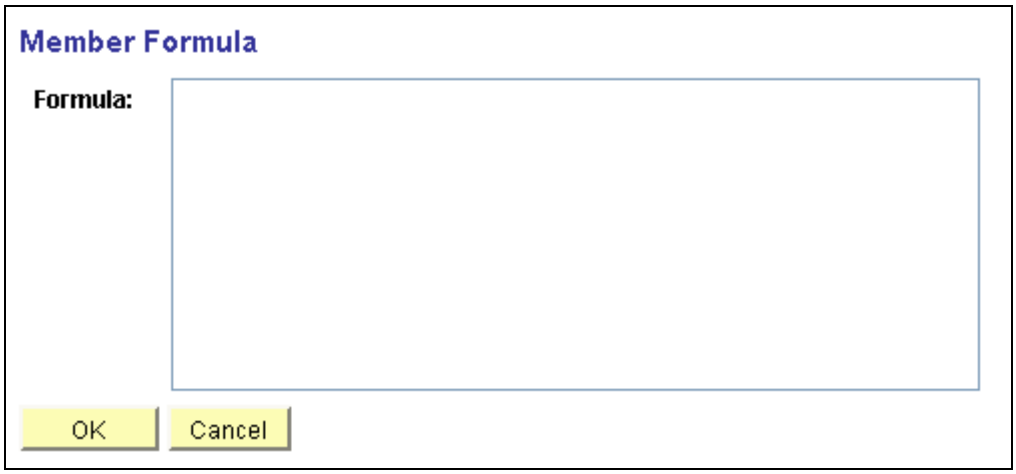
Peer Member Add page

Member Enter the name of the new member that will be a child or a peer of the currently highlighted member on the Dimension page.

OK Click to add the child or a peer member and return to the Dimension page.

Inserting a Member Formula

Access the Member Formula page (on the Dimension page, click the Formula link).



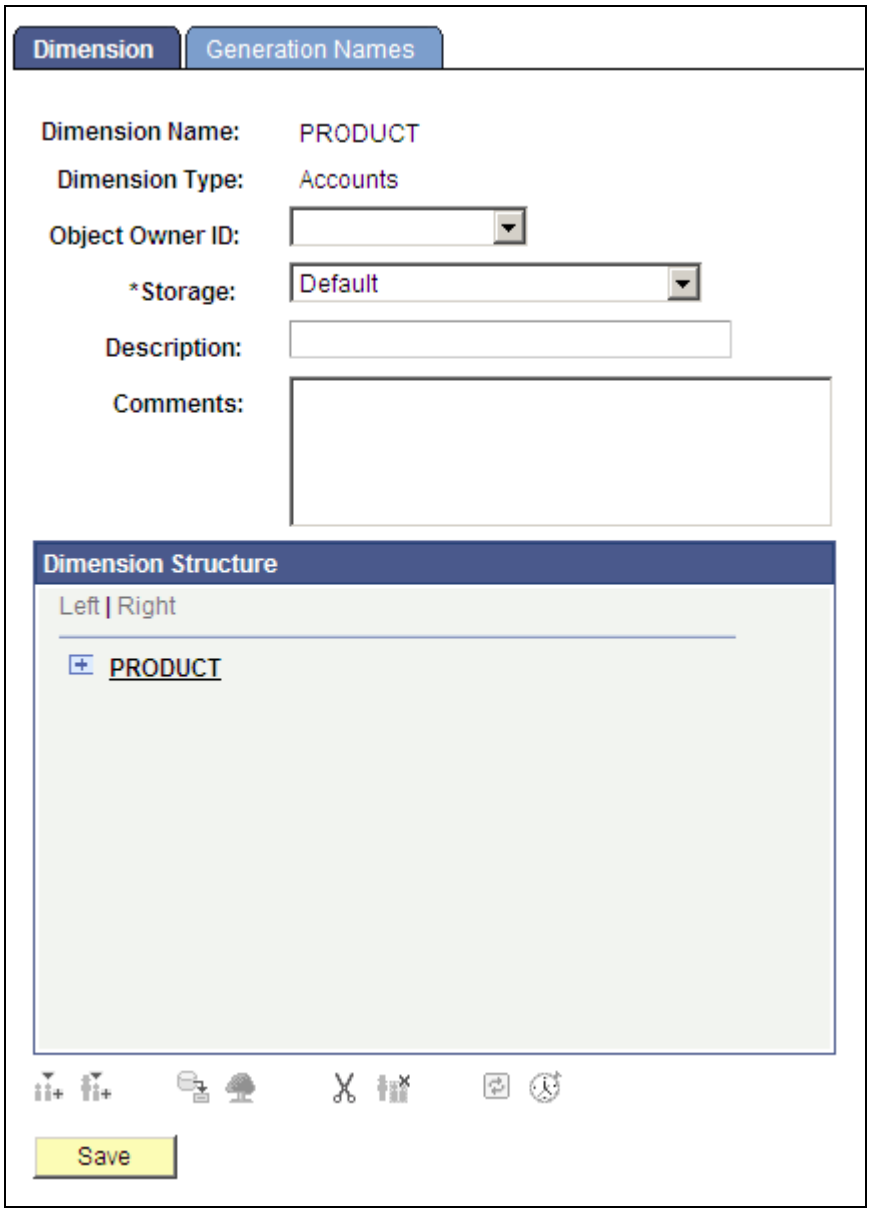
Member Formula page

Formula Enter a formula that will be used to calculate aggregates for the specific member.

Example: Defining Essbase Dimensions

Suppose that you need to create a product dimension based on a table that contains setID-controlled products. To create a product dimension, access the Dimensions page (select PeopleTools, Cube Builder, Essbase Cube Builder, Dimensions) and add a dimension with a name of PRODUCT.

This is an example of the Dimension page when you first create a dimension:



Example of the Dimension page when you first create the PRODUCT dimension

At this point, the Dimension page:

- Displays dimensional properties such as dimension type, storage option, and so on.

  Later on, depending on the dimension type, some of the tree object members may or may not have all of the available properties discussed in this book.

- Has an empty tree-like structure section with a root node that has the same name as the dimension, PRODUCT.

- Has all icons at the bottom of the page appearing not active.

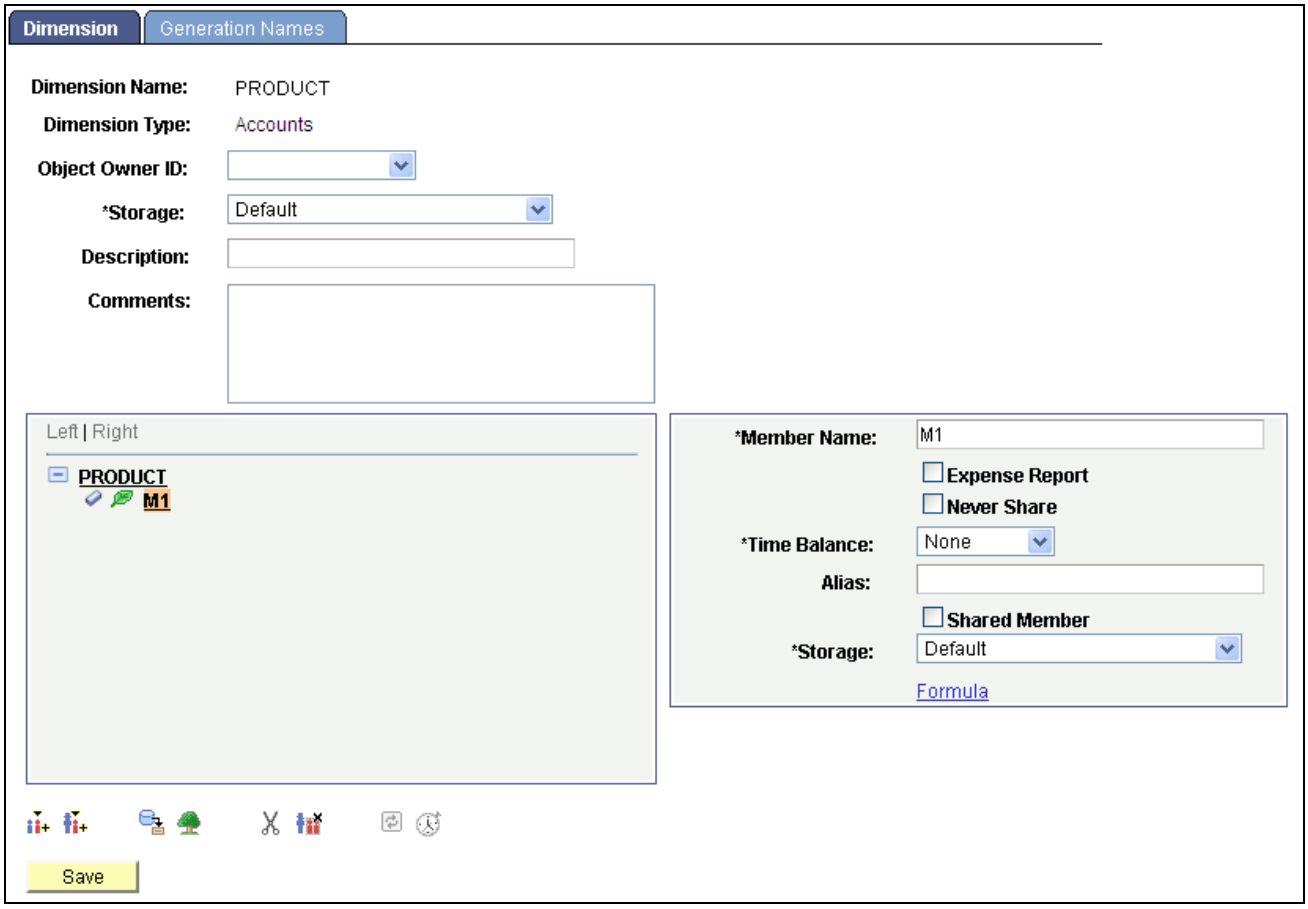
  Icons become active as they become relevant when you build the dimensional structure. For example, when you highlight a tree member, the relevant action icons become available.

  All actions in the icon area are applicable to whatever tree member is highlighted. For example, for dynamic trees and queries, you cannot delete any children.

Note. To create dimension, often you add member children and peers manually and then supply the various attributes for each member. Parent members (those with children) may have attributes that leaf members (those without children) do not have, or vice versa.

To add a child member, highlight the PRODUCT node and click the Add Member Child icon. The Child Member Add page appears.

Enter the name for the child member and click the OK button. The Dimension page reappears. This example shows a manually entered child member called *M1* and the properties that are available to be set for that particular *M1* member:



Example of the Dimension page with M1 member and its properties

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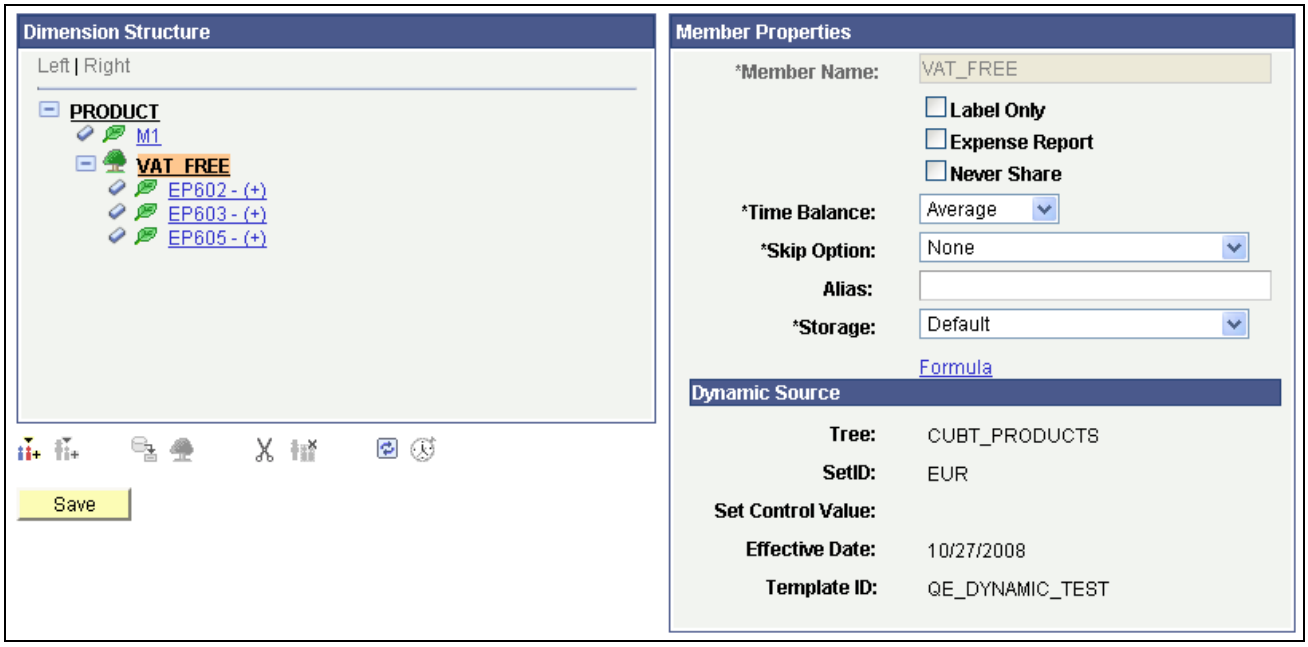
Note. *M1* is highlighted and its corresponding attributes appear to the right of the tree. You can change any of these attribute values. After adding more members, you can view attributes of each member by selecting each new node. Selecting a node highlights it and displays the attributes for that node to the right of the dimension tree.

This example illustrates the attributes of the member VAT_FREE, which shows that VAT_FREE member was built using a dynamic tree called CUBT_PRODUCTS. All of the tree key field values appear in the Dynamic Source section of the attributes. The top portion shows the general relevant attributes for the current member node:



Example of the attributes of the member VAT_FREE

Inserting a Tree Structure into the Dimension

When inserting a tree structure into a dimension using the Find Tree page, you need to define whether that tree reference is dynamic or static. Note the following differences between dynamic and static (nondynamic) trees:

- Dynamic trees do not store dynamic referenced members in the dimension. They store only a reference to the tree definition.

  When the dimension is sent to Essbase, the tree is reopened, read, and sent to Essbase when the cube needs to be populated.

  If you select the Dynamic option on the Find Tree page, the Template ID field appears, enabling you to select a template.

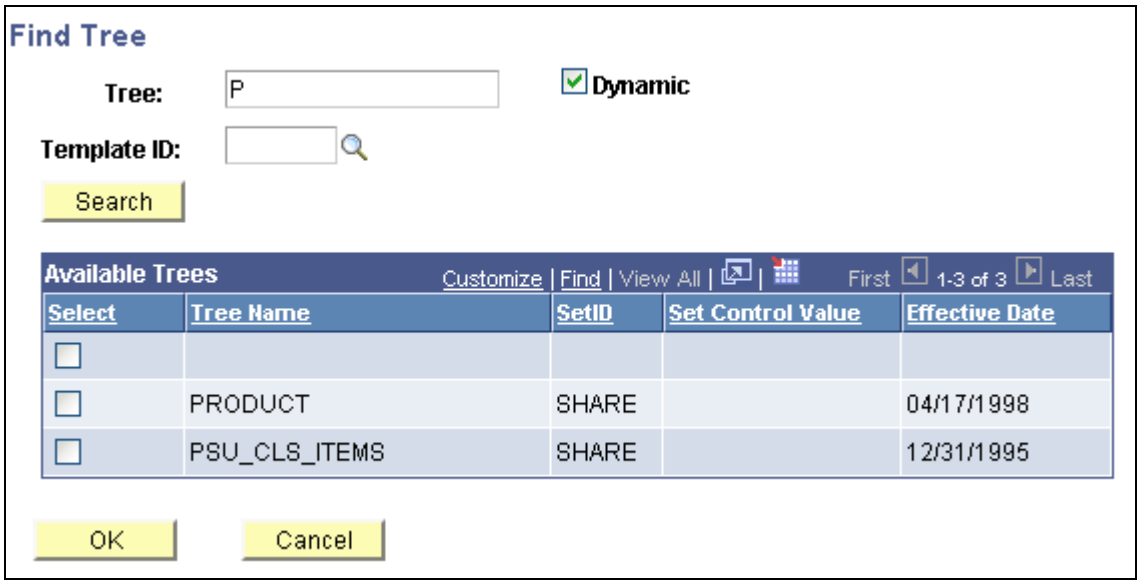
  You use templates to determine what each member of the dynamic tree should have as its defined properties. You create templates in their own component (PeopleTools, Cube Builder, Essbase Cube Builder, Dynamic Dimension Templates). You are not required to use templates because the system uses a default template automatically if you do not provide a value in this field. Only members that do not match template values are actually stored as part of the dimension.

  For example, if a tree has 50 members, the dimensional definition will not save 50 rows in the dimensional definition. Instead, it will store only the single row that references the tree name. From that point on, if you decide to add an alias for the 45th member, then the system stores only the 45th member and the tree reference member. Basically, the system stores only members for which you have changed the default values in the dimensional structure. For all other members, the assumption is that the member values match what is in the template for that dynamic reference or the default template that is used automatically. This technique saves storage space in the database.

- For static (nondynamic) trees, static references read the contents of the tree and store them within the dimension. All subsequent changes made to the tree are not reflected in the dimension. After the contents of the tree are read, the system does not save even the tree reference; it is as if you had manually entered all tree node and leaf values in the dimension.

Selecting a Tree

Access the Find Tree page (on the Dimension page, select a tree name and click the Assign From Tree icon).



Find Tree page

Dynamic Select to define this tree reference as dynamic.

Deselect this option to define this tree reference as static.

Template ID If the Dynamic option is selected (for dynamic trees), the Template ID field appears, enabling you to select a template.

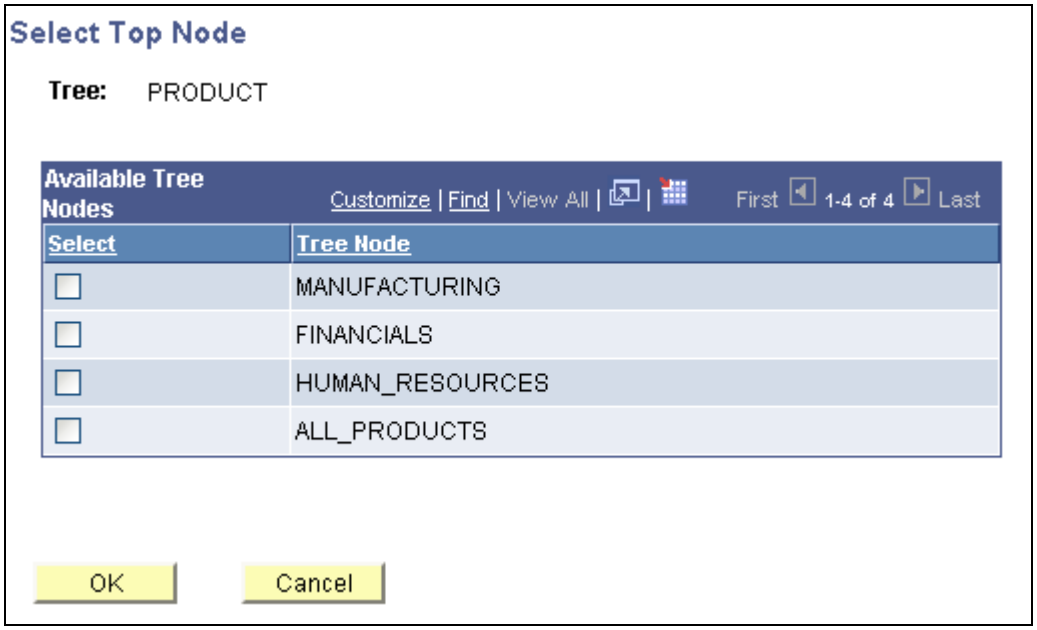
If the Dynamic option is deselected (for static queries), after the contents of the query are read not even the query reference is saved.

See Chapter 6, "Creating Dynamic Dimension Templates," page 69.

Available Trees Displays a list of trees that are defined in the system after you click the Search button.

Selecting the Top Node

Access the Select Top Node page (on the Dimension page, select a tree name and click the Assign From Tree icon; on the Find Tree page, select trees and click the OK button).



Select Top Node page

Available Tree Nodes This section displays a list of all the nodes from the selected tree.

Select Select one tree node as a starting point in the tree definition to use when copying the structure into the current dimension.

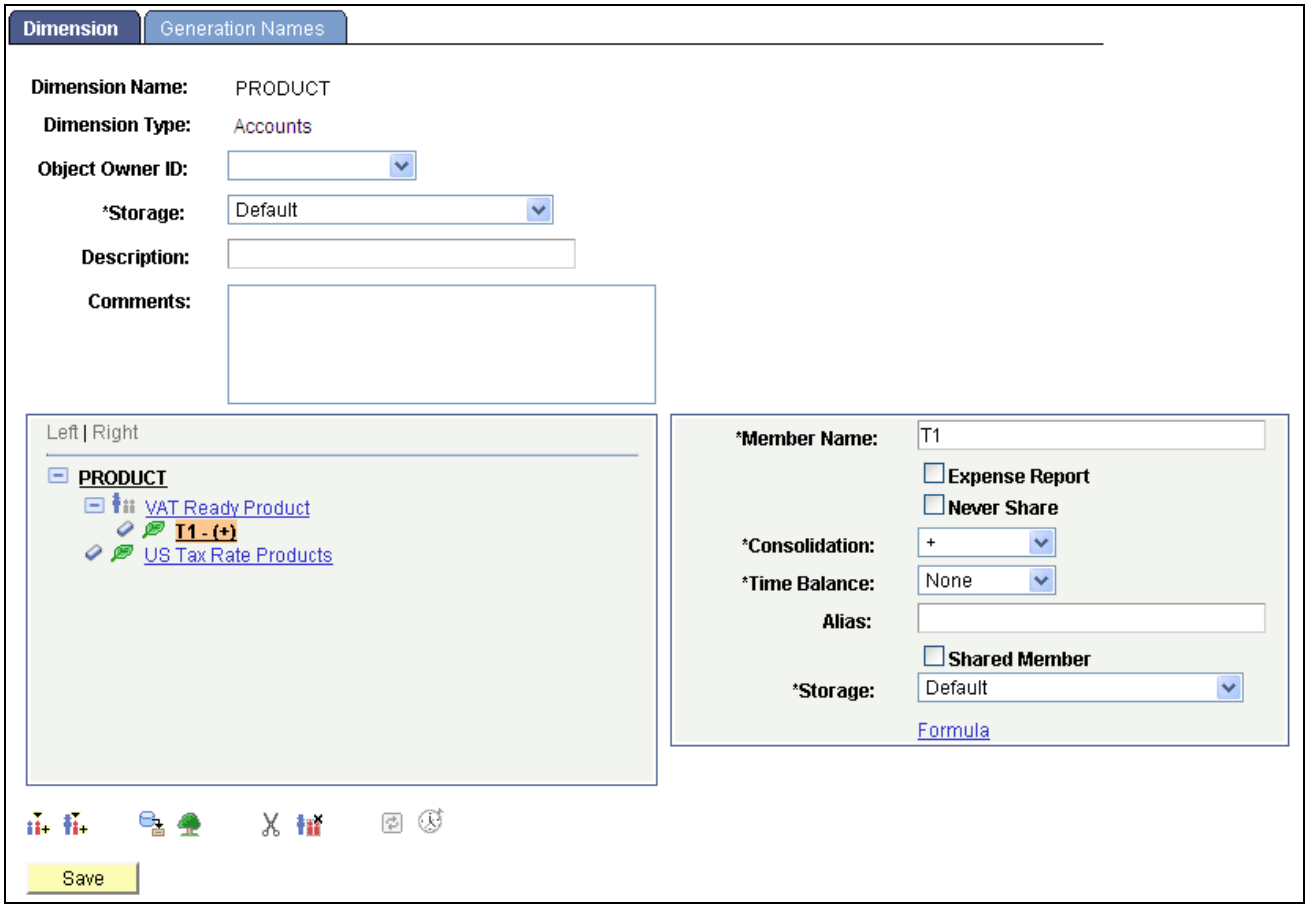
Note. If the actual top node of the tree is selected, then the entire tree will be copied.

OK After selecting the starting node, click the OK button to return to the Dimension page.

The tree structure is read, and the contents of the tree are placed in the current node of the dimension.

Example: Inserting a Tree Structure into the Dimension

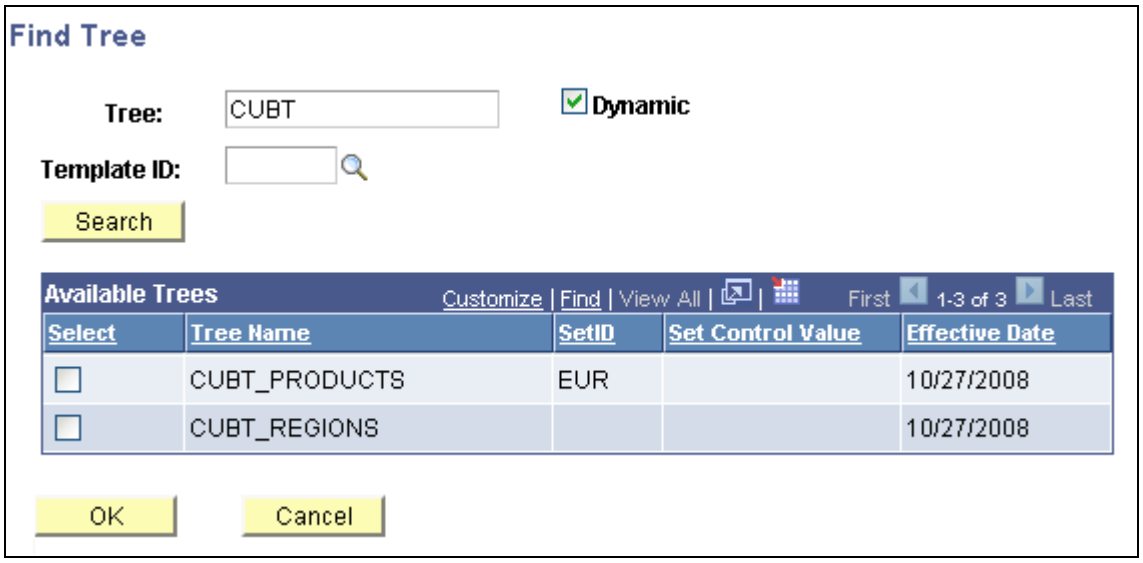
The Dimension page has two nodes, *VAT Ready Products* and *US Tax Rate Products*, that were added manually under the PRODUCT node, as shown in this example:



Example of the Dimension page with two nodes added under the PRODUCT root node

When you highlight the PRODUCT root node, the Add Member Child button below the tree becomes active. Subsequently, below the *VAT Ready Products* member, a child member was added with the name *T1*. When the *T1* child member is highlighted, the Assign From Tree icon became active; click it to connect with a tree structure at that point in the dimension tree.

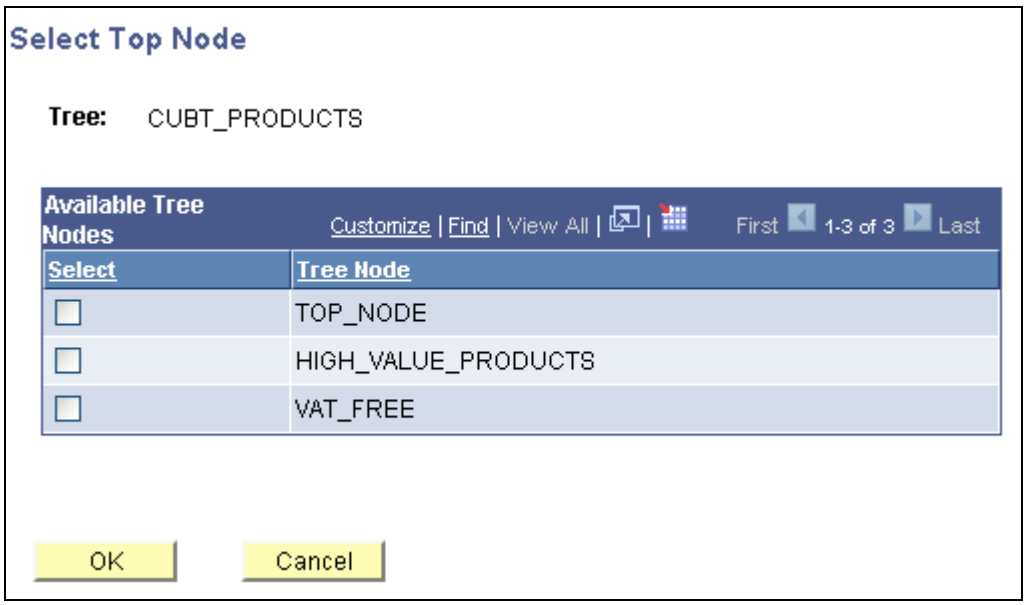
Click the Assign From Tree icon to access the Find Tree page, where you can select a tree. This example shows the Find Tree page:



Example of the Find Tree page

You need to define whether this tree reference is dynamic or static, select a tree name, and click the OK button. The Select Top Node page appears with the Available Tree Nodes section listing all the nodes from the selected tree.

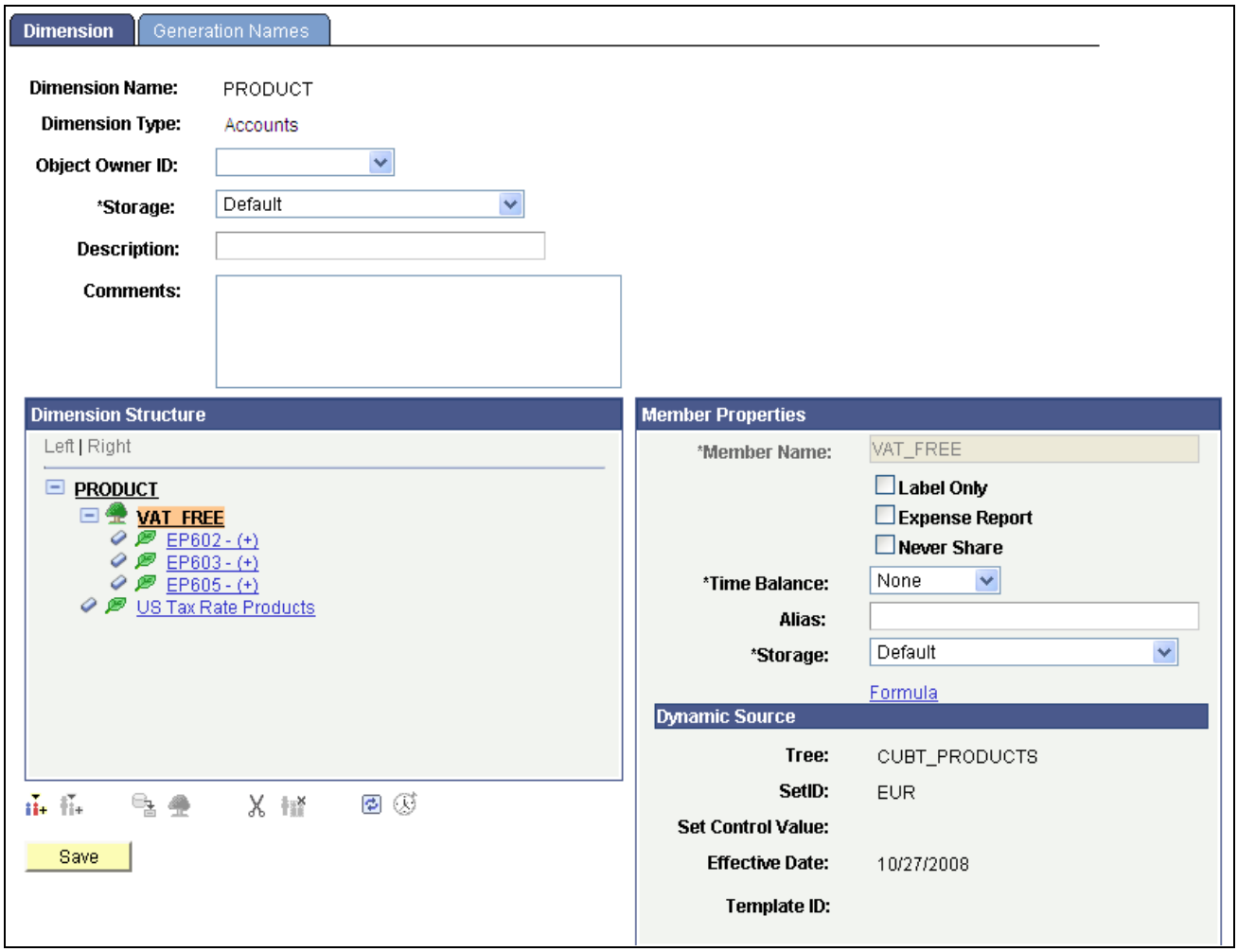
This is an example of the Select Top Node page:



Example of the Select Top Node page

You need to select a starting point in the tree definition and click the OK button to return to the Dimension page. Note that the tree structure is read and the contents of the tree are placed in the current node of the dimension.

Because VAT_FREE was selected as the starting node, that member is placed at the starting point and all of the children of that node are read, after which all of them become members of the dimension. This example shows the PRODUCT dimension after the contents of the tree definition are copied:



Example of the Dimension page with contents of the tree added in the VAT_FREE node

In this example, because you selected a dynamic tree, a tree icon is present in the dimension member that references the tree definition. The three items that were read are not actually stored as part of the dimension, but they are read every time you view the dimension. That is, after you save this dimension to the database, if the tree is modified to have more nodes or leaves, then the next time you view the dimension it will display the contents of the tree with the modifications. Note that this process does not happen with static tree members.

For a static tree member, no reference is made to the tree that you used during the initial creation of the members and no tree icon appears to indicate that those members were originally created from a tree definition.

Inserting a Query into the Dimension

As with trees, queries can also be used to populate a dimension. Queries also use templates. While assigning members from query definitions, you need to supply prompt values, if any, that are required by the query.

For dynamic queries, as with dynamic trees, you do not actually store query results in the dimension definition, except for those that do not match any assigned template for the query (or the default template if no actual template was assigned). At the time the dimension is sent to the Essbase database, the query will be rerun to make sure it reflects the current result rows from the query.

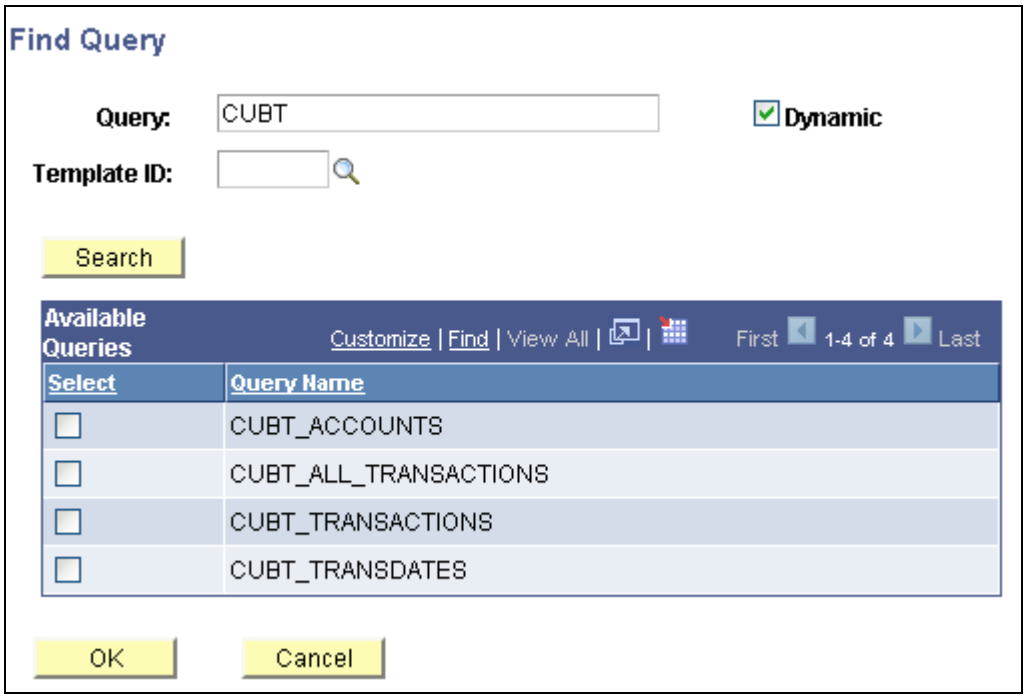
For static queries, take the query results and store all of those rows within the dimension.

Note. When you create dimensions, you may have issues with queries that return a large number of rows. When a query returns thousands of rows, it may cause PIA to crash or it may cause the dimension builder to have long waiting times to display the results in the dimensional tree.

If you have issues with large results query, use dynamic queries. By using dynamic queries, you ensure that only a certain number of rows appear at one time within the dimensional structure.

Selecting a Query

Access the Find Query page (on the Dimension page, highlight a tree member and click the Assign From Query icon).



Find Query page

Dynamic Select to define this query reference as dynamic.

Deselect this option to define this query reference as static.

Template ID If the Dynamic option is selected (for dynamic queries), then the Template ID field appears, enabling you to select a template. Optionally, assign a defined template to the query.

If the Dynamic option is deselected (for static queries) after the contents of the query are read, not even the query reference is saved.

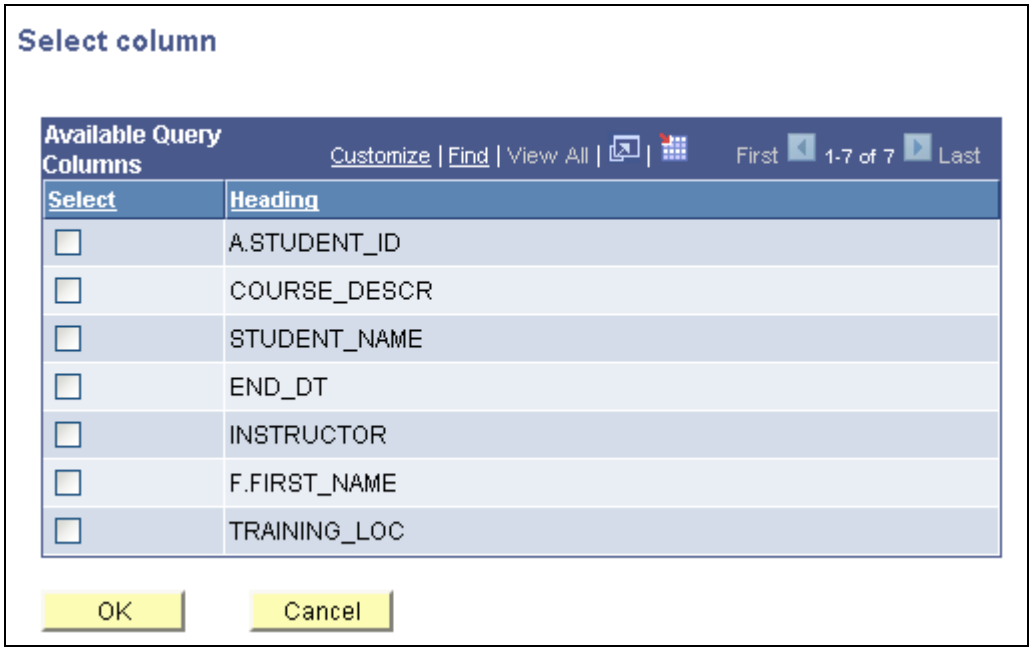
See Chapter 6, "Creating Dynamic Dimension Templates," page 69.

Available Queries Displays a list of queries that are defined in the system after you click the Search button.

Note. Only public queries to which the current user has authorization appear.

Selecting a Column

Access the Select column page (on the Dimension page, highlight a tree member and click the Assign From Query icon; on the Find Query page, select queries and click the OK button).



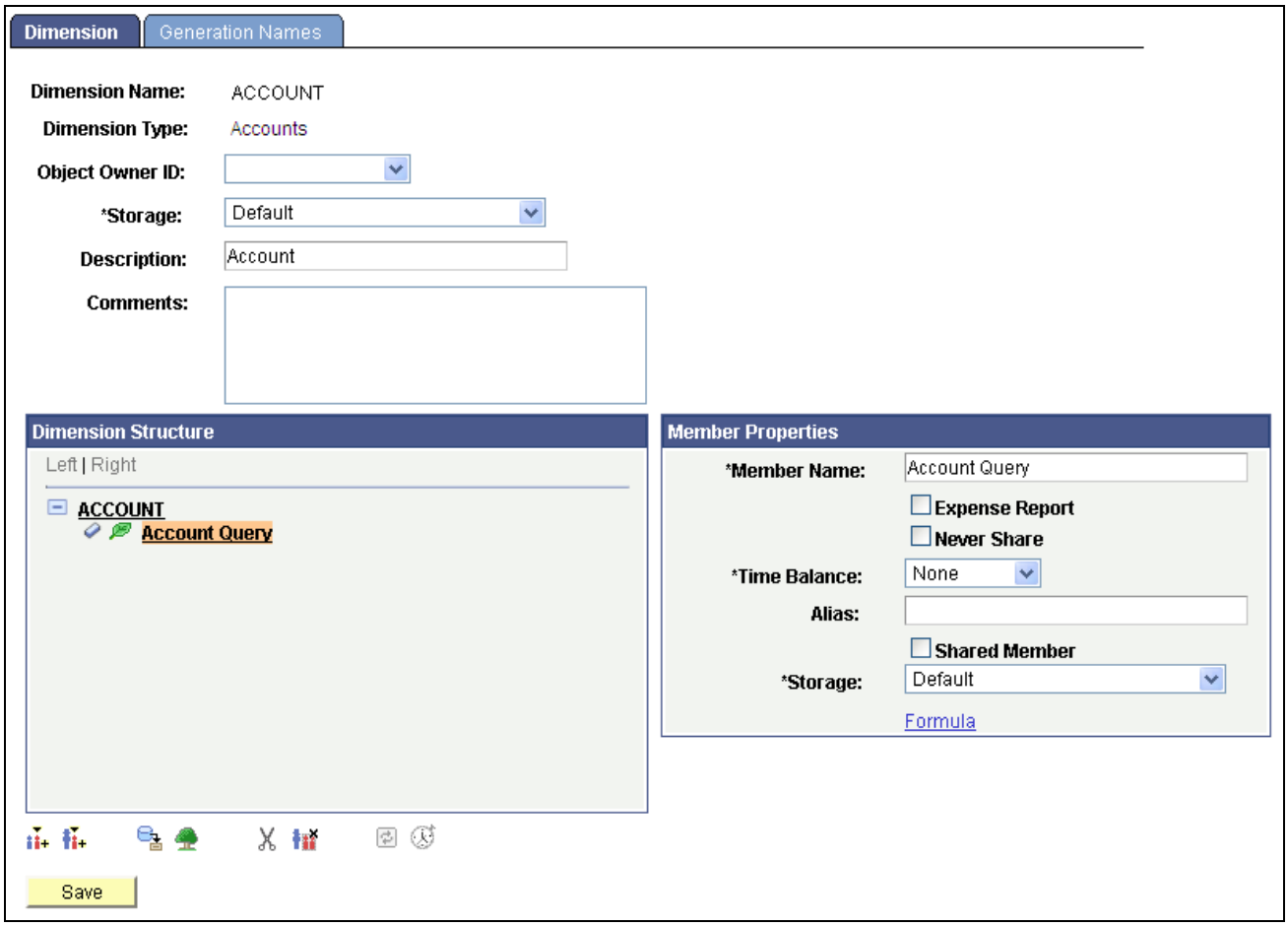
Select column page

Available Query Columns Select columns from a list of columns that are defined in the system.

OK After selecting the columns, click the OK button to return to the Dimension page.

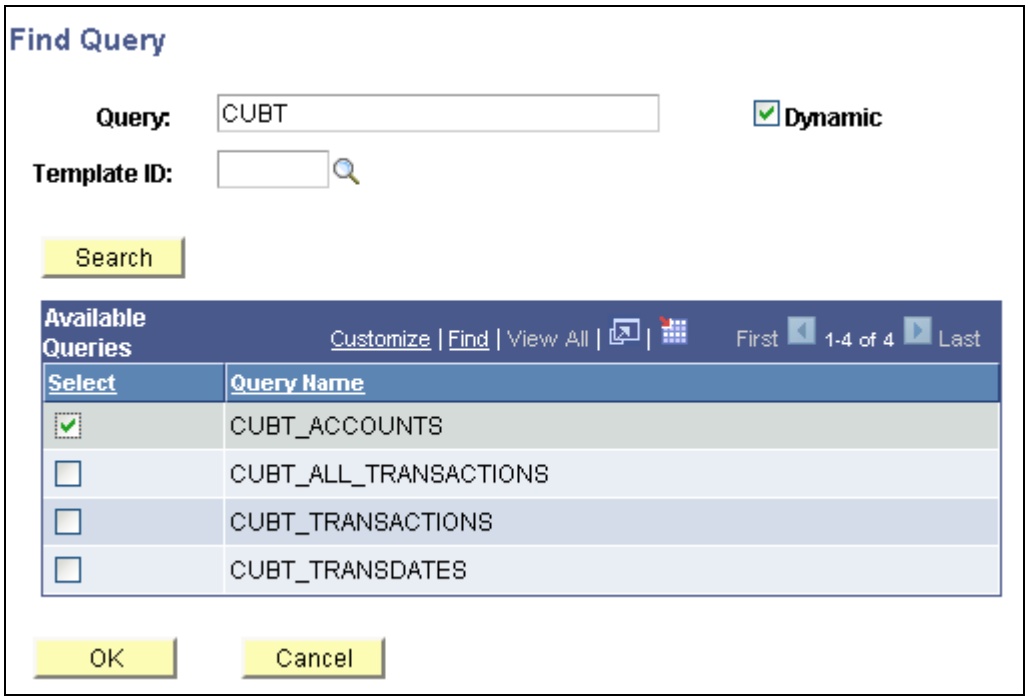
Example: Inserting a Query into the Dimension

This example illustrates a child member of the root node called *Account Query* that was added manually:



Example of the Dimension page with ACCOUNT_QUERY member

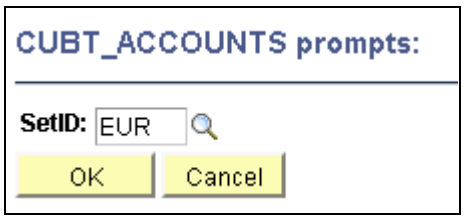
Highlight the *Account Query* member and click the Assign From Query icon. the Find Query page appears:



Find Query page

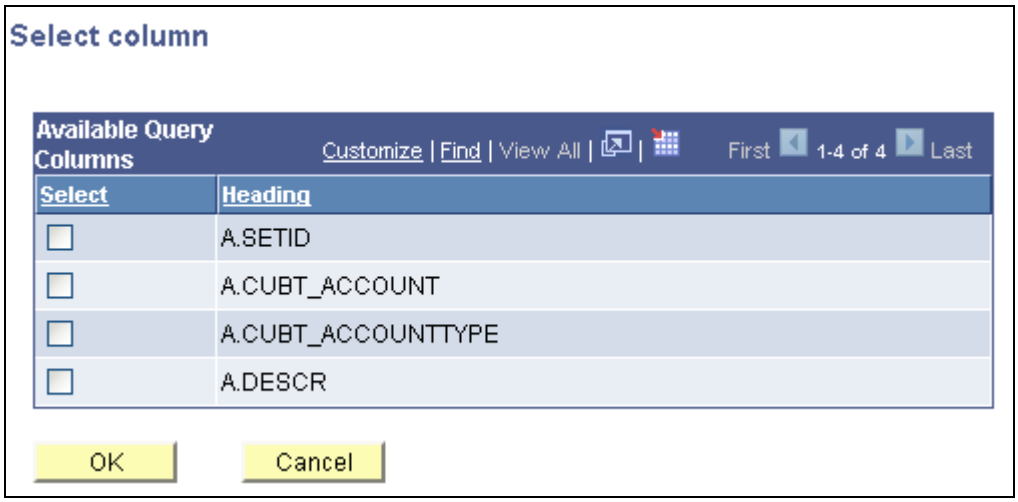
You can search a partial name query. Note that the system displays only public queries to which the current user has authorization. You need to select a query and click the OK button. You also can assign a defined template. In this example, the results of the query yield leaf members, so use the query dynamically.

If the selected query has a prompt criteria defined, then a prompt page appears, enabling you to enter values to satisfy the prompt requirement for the query. In this case, query CUBT_ACCOUNTS has a prompt on the SetID field, and you must supply this value to run the query:



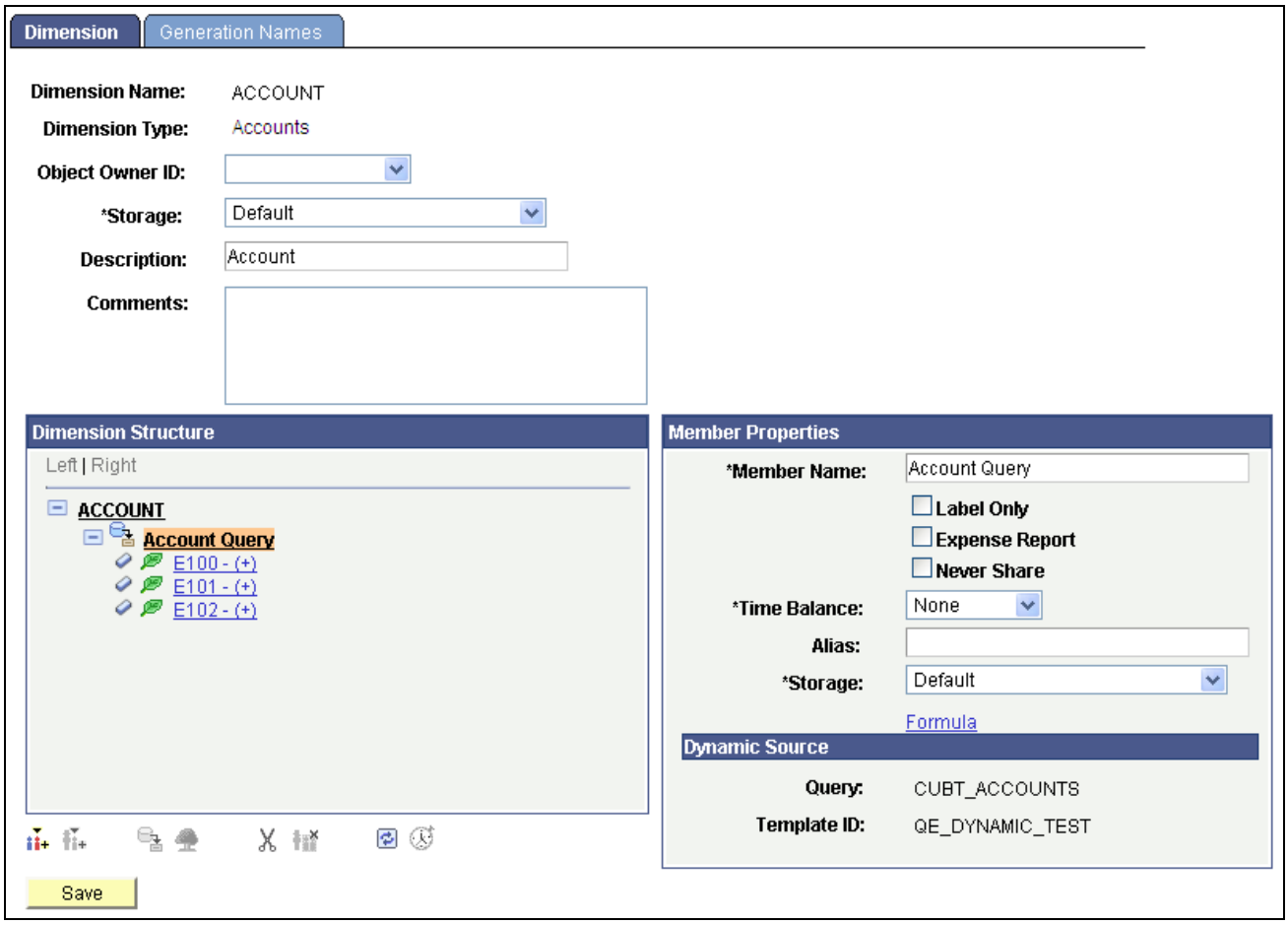
Example of query CUBT_ACCOUNTS with a prompt on the SetID field

After entering the required values and clicking the OK button, the last step is to select a query column to fill the dimension structure using the Select column page:



Example of the Select column page

In this scenario, you need to select A.CUBT_ACCOUNT as the desired field. After selecting the desired field, click the OK button to run the query. The results appear as part of the dimensional structure, as shown by this example:



Example of the Dimension page with results displayed as part of the dimensional structure

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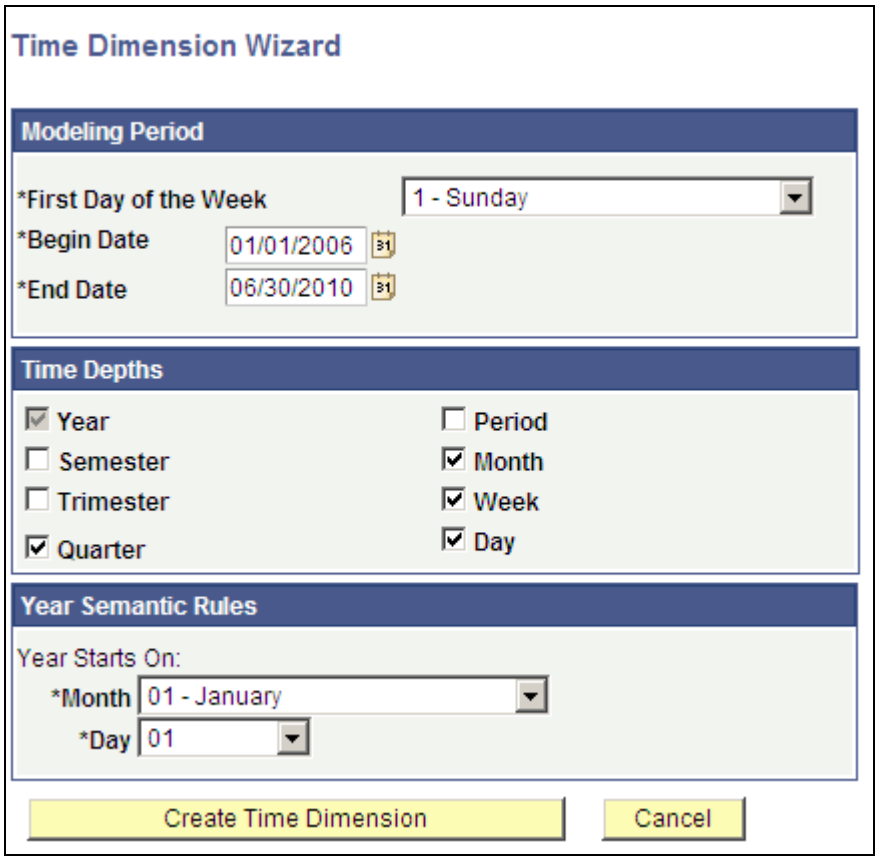
Note. The results of running this query should yield unique values for the leaf members. All leaf values under the same parent must always be unique for the dimension to be valid.

A query icon is in the member that references the dynamic query. If the query was not run as dynamic, then a normal parent icon exists and—from that point on—no indication exists that the members were added as part of running a query. As with static trees, it is as if you had manually typed in all the members.

Defining Time Dimensions

Access the Time Dimension Wizard page (on the Dimension page, click the Time Dimension Wizard icon).



Time Dimension Wizard page

Use the Time Dimension Wizard page to automatically populate the members of a time dimension.

Note. The Time Dimension Wizard icon is available only for time dimensions and not for other dimension types.

First Day of the Week Select the first day of the calendar week on which the intended calendar starts.

Begin Date Select the begin date for the time range for which members are created.

End Date Select the end date for the time range for which members are created.

Time Depth Select the option next to a hierarchy level to include it in the hierarchy.

Note. Shaded levels cannot be used in combination with other selections. For example, Semester and Trimester hierarchies are mutually exclusive. Time-depth selections define the members that are created in the time dimension.

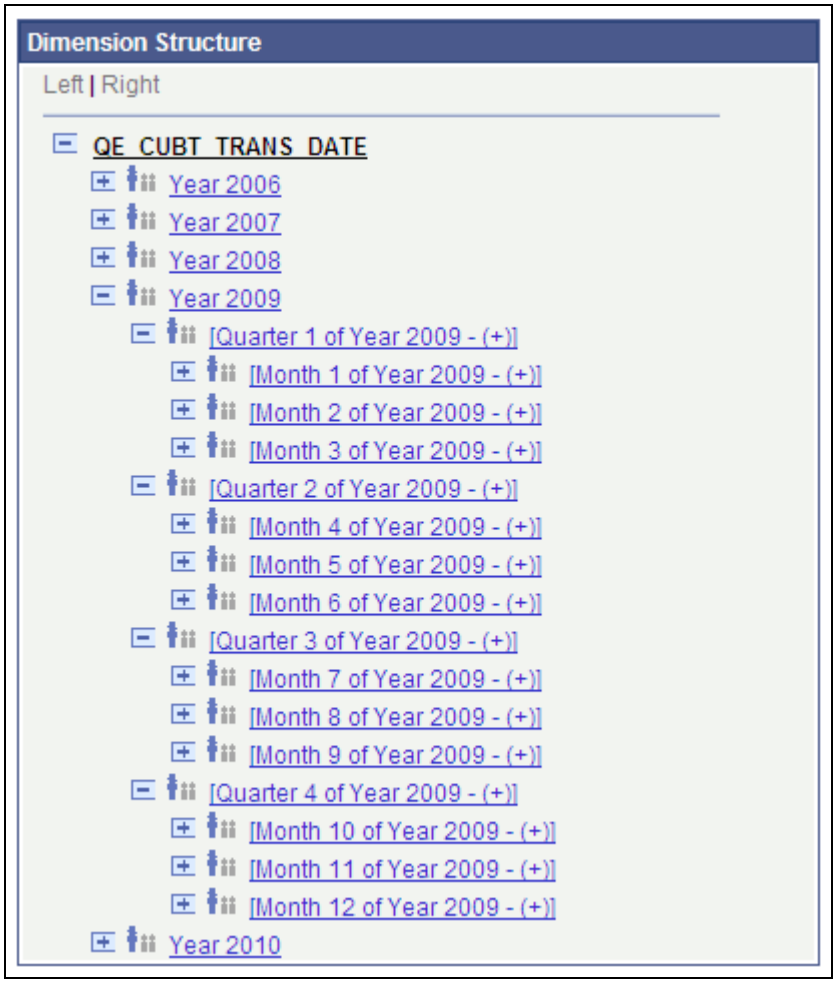
Year Semantic Rules Select to define the month and day when semantic rules start the year.

Time Dimension Members

Time Dimension members are created as manual members (not dynamic) and they are in PeopleSoft Date-Time format, which is compatible with Essbase format. However, you should create the data query sources in a standard PeopleSoft Date-Time format as well; otherwise, the data-load process will fail because it will not recognize matching members.

During the data-load process, Essbase verifies that the passed cells match the members that are already in the dimension. For example, if the time members for the dates of a year were created in the dimension with format *YYYY-MM-DD* and the quarters in the data source query are set as *mm/dd/yy*, then Essbase returns an error message to inform you that the members were not encountered in the time dimension.

On the Time Dimension Wizard page, after you select the time dimension and click the Create Time Dimension button, the Time Dimension members appear on the Dimension page, as shown in this example:



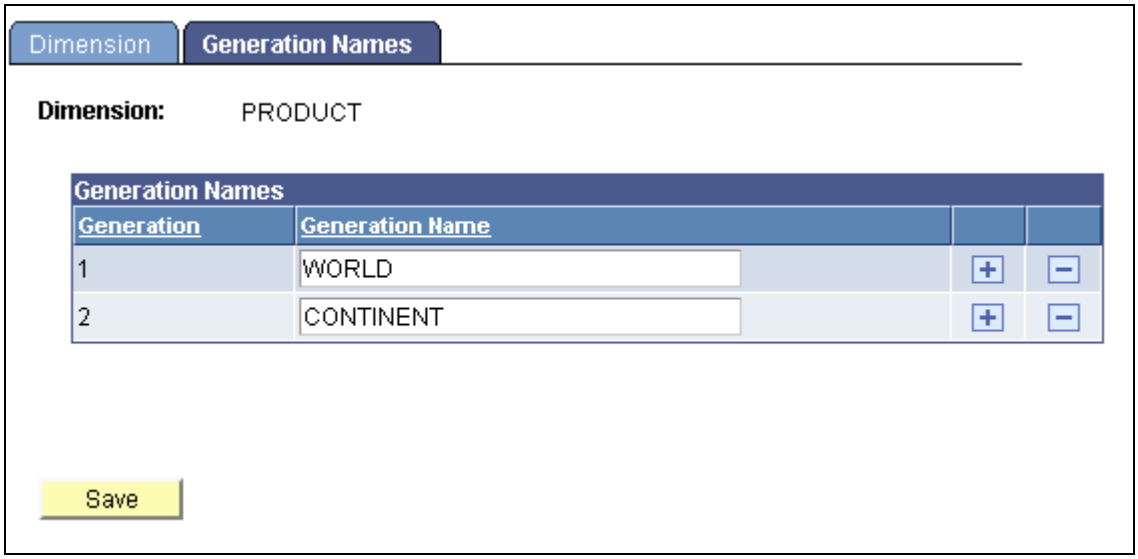
Dimension page, Dimension Structure section

Note. To prevent date-time format conflicts, Essbase eliminates previously created members before it automatically displays new members.

You also can add new members to the time dimension posterior to the automatic population of members either by PeopleSoft trees, PeopleSoft queries, or manually. However, the members must be in the same PeopleSoft date-time format to be consistent with the automatically populated members.

Adding Generation Names

Access the Generation Names page (on the Dimension page, select the Generation Names tab).



Generation Names page

Generation Displays the generation of the dimension.

The top parent of a dimension is called generation 1, each child of generation 1 is called generation 2, each child of generation 2 is called generation 3, and so on.

For example, as shown on the Generation Names page, the PRODUCT dimension has two generation names: WORLD and CONTINENT. These names are not relevant to the graphical user interface (GUI), but they can be used on the Essbase side when Essbase references an entire generation in a member formula.

Note. In Essbase terminology, a generation refers to a level within a dimension. A root branch of the tree is generation 1. Generation numbers increase as you count from the root toward the leaf member.

Level also refers to a branch within a dimension; however, levels reserve the numerical ordering used for generations.

Generation Name Enter the generation name for each generation.

Chapter 5

Defining Essbase Cube Outlines

This chapter discusses how to define cube outlines.

Defining Cube Outlines

This section discusses how to:

- Add cube dimensions to a cube outline.
- Add cube data queries to a cube outline.

Pages Used to Define Cube Outlines

Page Name	*Definition Name*	*Navigation*	*Usage*
Cube Outline	CUB_OUTLINE	PeopleTools, Cube Builder, Essbase Cube Builder, Outlines	Add dimensions to the current outline.
Add Cube Dimensions	CUB_OUTLINE_SEC	PeopleTools, Cube Builder, Essbase Cube Builder, Outlines On the Cube Outline page, click the Add Cube Dimensions link.	Select dimensions to add to the current outline.
Current Dimension List	CUB_OUTDIM_SEC	PeopleTools, Cube Builder, Essbase Cube Builder, Outlines On the Cube Outline page, click the Remove Cube Dimensions link.	Remove dimensions from the current outline.
Data Sources	CUB_OUTLINE2	PeopleTools, Cube Builder, Essbase Cube Builder, Outlines On the Cube Outline page, select the Data Sources tab.	Add the cube data query or queries. You can supply one or more queries to fill the cube.

Page Name	*Definition Name*	*Navigation*	*Usage*
Find Query	CUB_QRYSEARCH_SEC	PeopleTools, Cube Builder, Essbase Cube Builder, Outlines On the Cube Outline page, select the Data Sources tab. On the Data Sources page, click the Add Query link.	Search for available queries.
Dimension Mapping	CUB_OUTLINE2_SEC	PeopleTools, Cube Builder, Essbase Cube Builder, Outlines On the Cube Outline page, select the Data Sources tab. On the Date Sources page, click the No Dimension Mapped link for the selected outline heading.	Map columns from data extraction queries to dimensions, select a column from data extraction as the measure, and unmap previously mapped columns.
Query Prompt Values	CUB_QRYPROMPT_SEC	PeopleTools, Cube Builder, Essbase Cube Builder, Outlines On the Cube Outline page, select the Data Sources tab. On the Date Sources page, click the Query Parameters link for the selected outline heading.	View the current prompt values for a query and change them if necessary.
Member Formula	CUB_FORMULA_SEC	PeopleTools, Cube Builder, Essbase Cube Builder, Outlines On the Cube Outline page, click the Formula link.	Enter formula information for an outline member.

Adding Cube Dimensions to a Cube Outline

Access the Cube Outline page by selecting PeopleTools, Cube Builder, Essbase Cube Builder, Outlines.

Cube Outline page

Note. Depending on the outline type, some of the outline may not have all of the available properties or fields that are discussed in this section.

Description Enter the description that you want to associate with the cube outline.

Object Owner ID Select the owner of the cube outline.

The owner ID helps to determine the product, feature, or application team that last made changes to this outline.

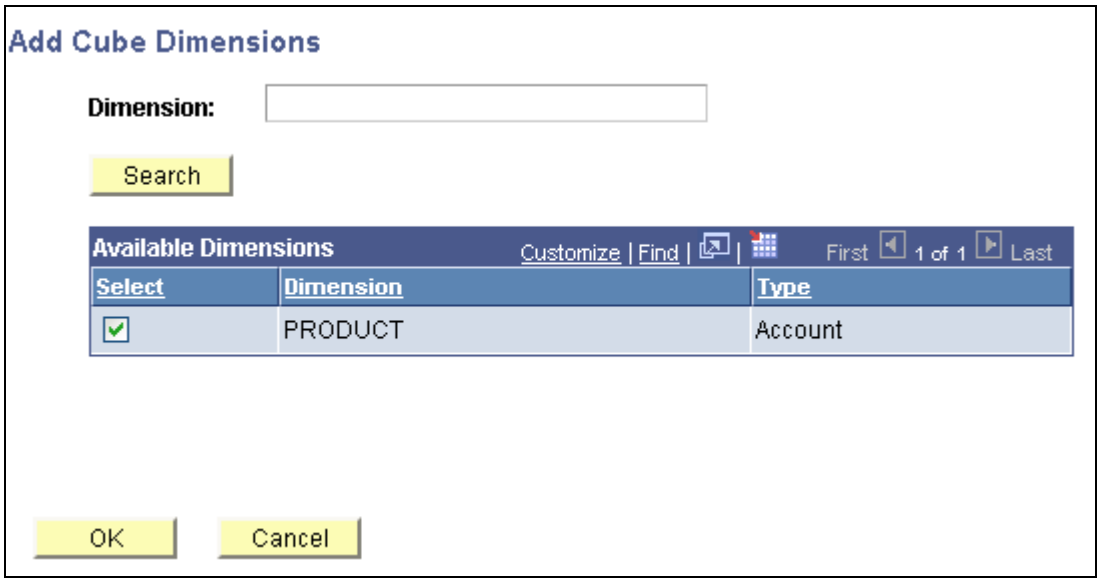
Outline Type Displays the type of outline. Available types are:

- *ASO:* aggregate storage
- *BSO:* block storage

Duplicate Member Allowed	Select to indicate that duplicate member names are allowed in the dimensions. **Note.** To support duplicate members, users must create a data source query using the fully qualified name of each member; otherwise, the Essbase server will not be able to identify the member to load data into. See Essbase documentation for more information about Fully Qualified Name Members.
Auto Configure Sparsity	Select to enable Essbase to automatically set sparsity levels. Deselect to manually set the sparsity levels. After you deselect this option, you can set the sparsity of each dimension in the template to either *Sparse* or *Dense.* **Note.** Dimensions marked as *Sparse* might take up significantly more space in the resulting cube than those marked as *Dense.* If you mark every dimension as sparse, you may end up with an enormous cube that is not practical or even possible to store on even the most powerful server. That is why the Time and Account dimensions are *Dense* level by default. You can change these settings in Essbase after you create your cube. Whether you change the sparsity settings from Cube Manager or from Essbase, be careful when adjusting them and refer to the Oracle Essbase documentation.
Run Default Calc (run default calculation)	Select this option to have the system run the default calculation script in Essbase when the cube is created; Essbase aggregates the tree in the given rollups, but it does nothing else. Deselect this option to create a custom calculation script.
Add Cube Dimension	Click to access the Add Cube Dimension page, where you can add dimensions to the current outline. **Note.** A dimension can be used only once in an outline.
Remove Cube Dimension	Click to access the Current Dimension List page, where you can remove dimensions from the current outline.
<Outline tree section>	In this section, each dimension is highlighted by a bright green icon. The dimension contents are shown in the outline.
<Member attributes section>	Located at the right of the tree, this section displays the corresponding attributes. **Note.** You can change these values using the Dimension page.
Dynamic Source	This section appears only for dynamic queries. It displays only a frame size of members with general information about the contents of the dimension.

Inserting Cube Dimensions

Access the Add Cube Dimensions page (on the Cube Outline page, click the Add Cube Dimensions link).



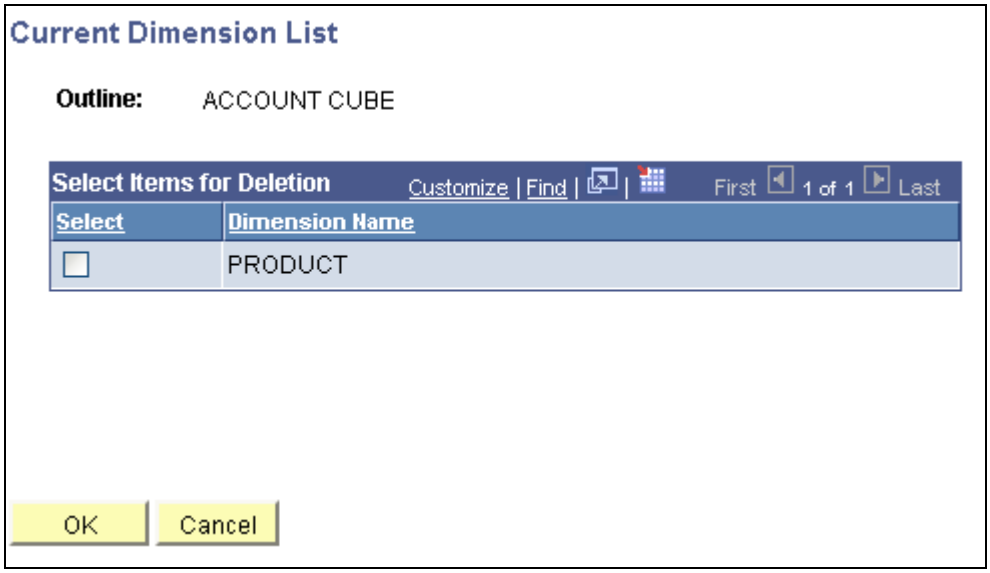
Add Cube Dimensions page

Search Click to display all dimensions that are not already inserted into the dimension.

Available Dimensions Select a dimension and click the OK button to return to the Cube Outline page.

Deleting Cube Dimensions

Access the Current Dimension List page (on the Cube Outline page, click the Remove Cube Dimensions link).



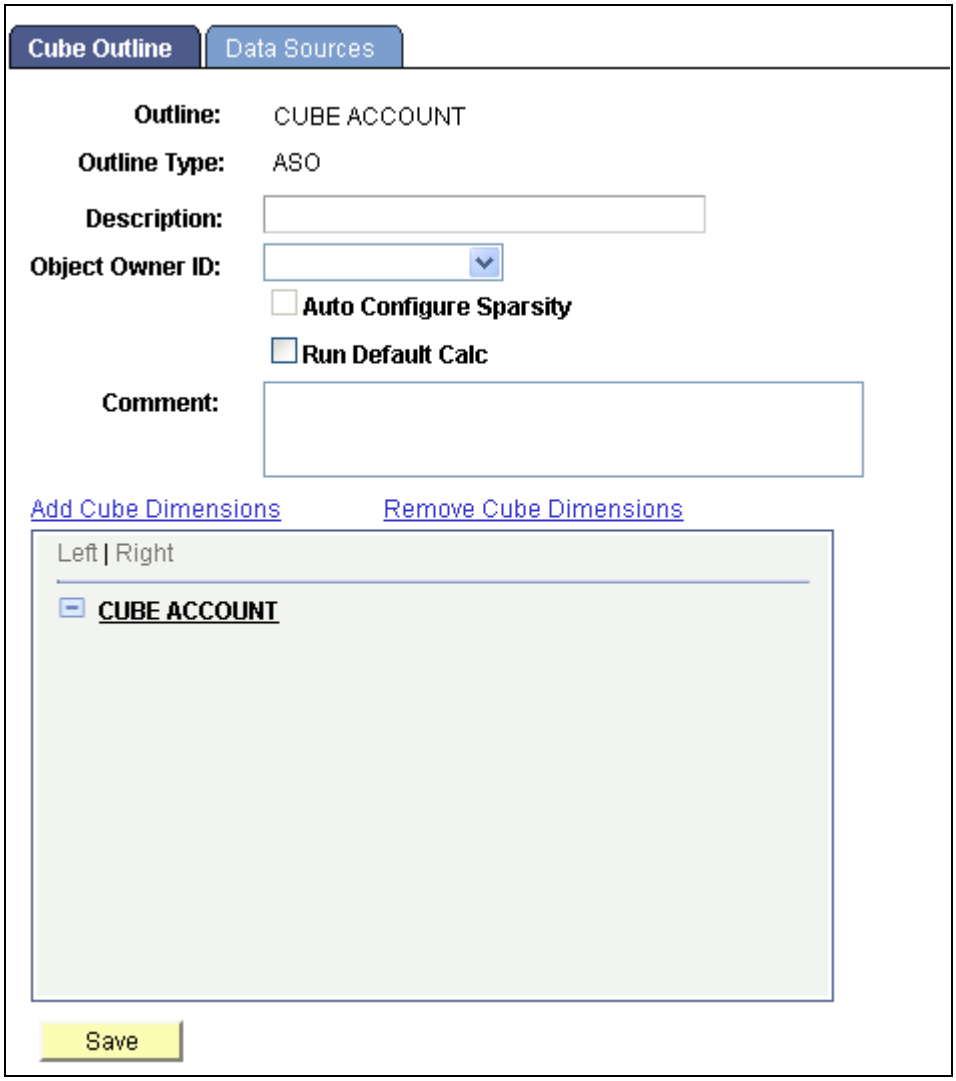
Current Dimension List page

Select Items for Deletion Select a dimension that you want to delete from the cube outline.

OK Click to delete the selected dimension and return to the Cube Outline page.

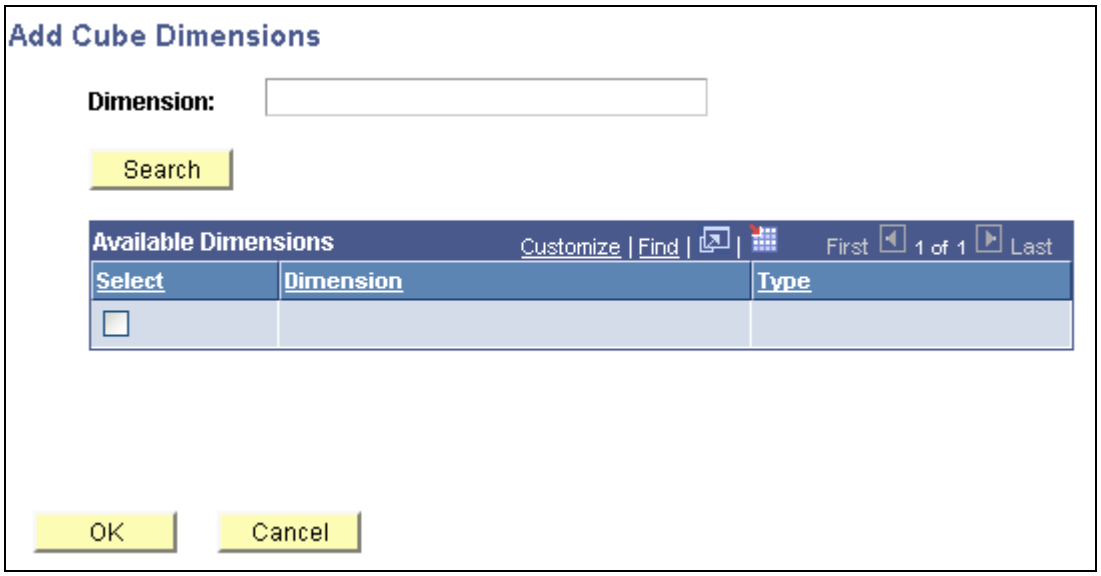
Example: Adding Cube Dimensions to a Cube Outline

Access the Outlines component by selecting PeopleTools, Cube Builder, Essbase Cube Builder, Outlines. In this example, you add a new outline named ACCOUNT_CUBE:



Cube Outline page

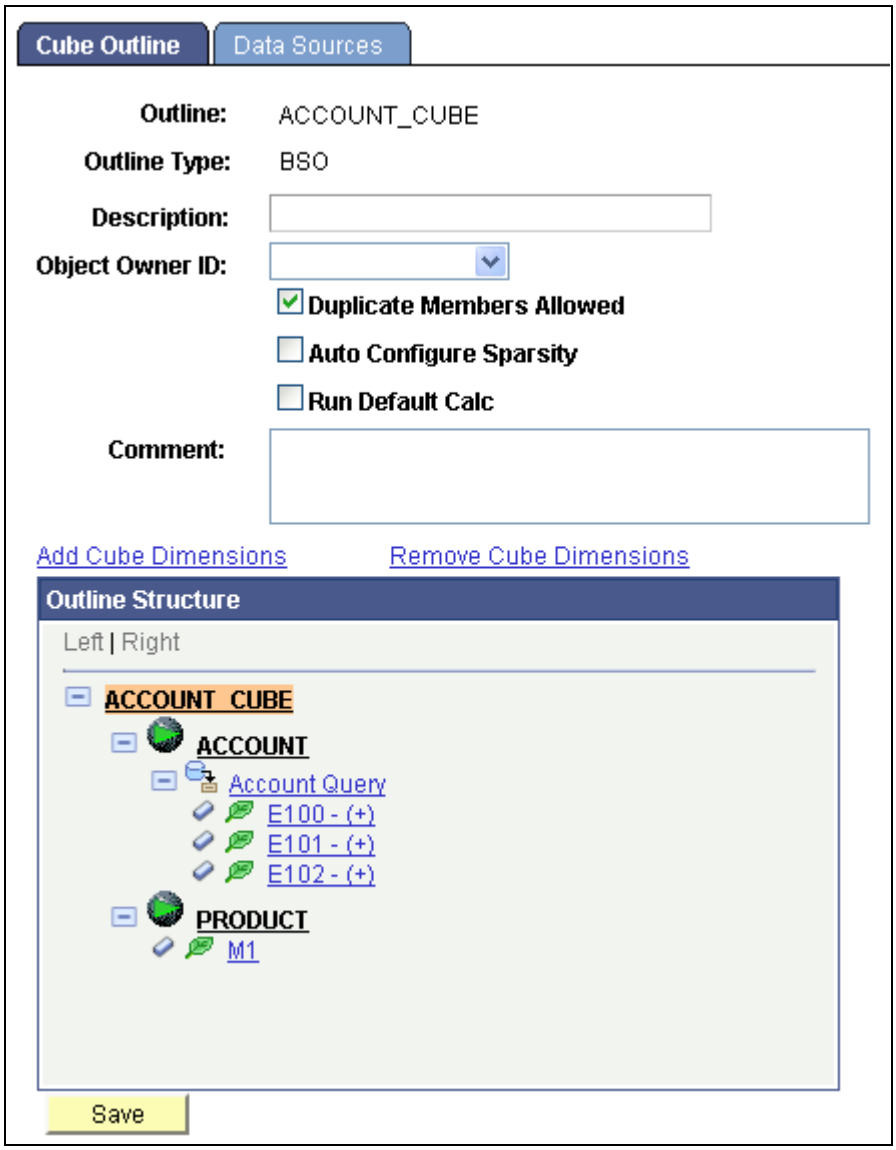
On the Cube Outline page, click the Add Cube Dimensionslink to access the Add Cube Dimension page, where you can add dimensions to the current outline. Note that a dimension can be used only once in an outline.



Add Cube Dimensions page

Click the Search button. The Available Dimensions section displays dimensions that are not already inserted into the dimension.

Select a dimension and click the OK button. The Cube Outline page reappears displaying the selected dimension. In this example, the Cube Outline page displays the ACCOUNT and PRODUCT dimensions:



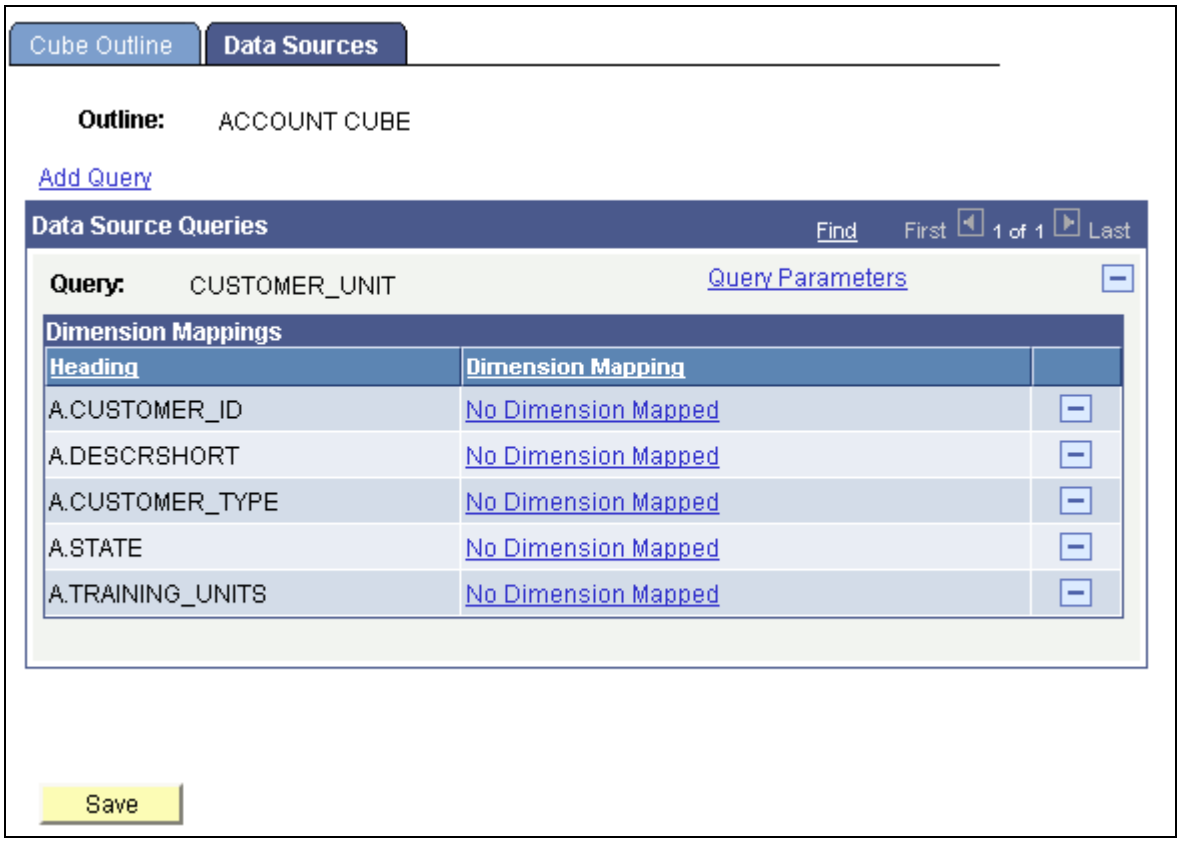
Cube Outline page displaying the ACCOUNT and PRODUCT dimensions

Each dimension is highlighted by a bright green icon. The dimension contents are shown in the outline.

Note. For dynamic queries, only a frame size of members is shown to give an idea of the contents of the dimension. The other frames are not viewable from this component.

Adding Cube Data Queries to a Cube Outline

Access the Data Sources page (on the Cube Outline page, select the Data Sources tab).



Data Sources page

Add Query Click to access the Find Query page, where you can search for and select a query from available queries.

Note. The query must select one column for each dimension in the outline plus one column for the measure. The measure is the numeric data that is the key piece of analysis in the online analytical processing (OLAP) cube, which is a set of multidimensional cells that hold numeric data.

Query Parameters Click to access the Query Prompt Values page, where you can view the current prompt values for a query and modify them as needed.

Dimension Mappings Displays a set of columns that will build your cube.

No Dimension Mapped Click to access the Dimension Mapping page, where you can map the column to a dimension.

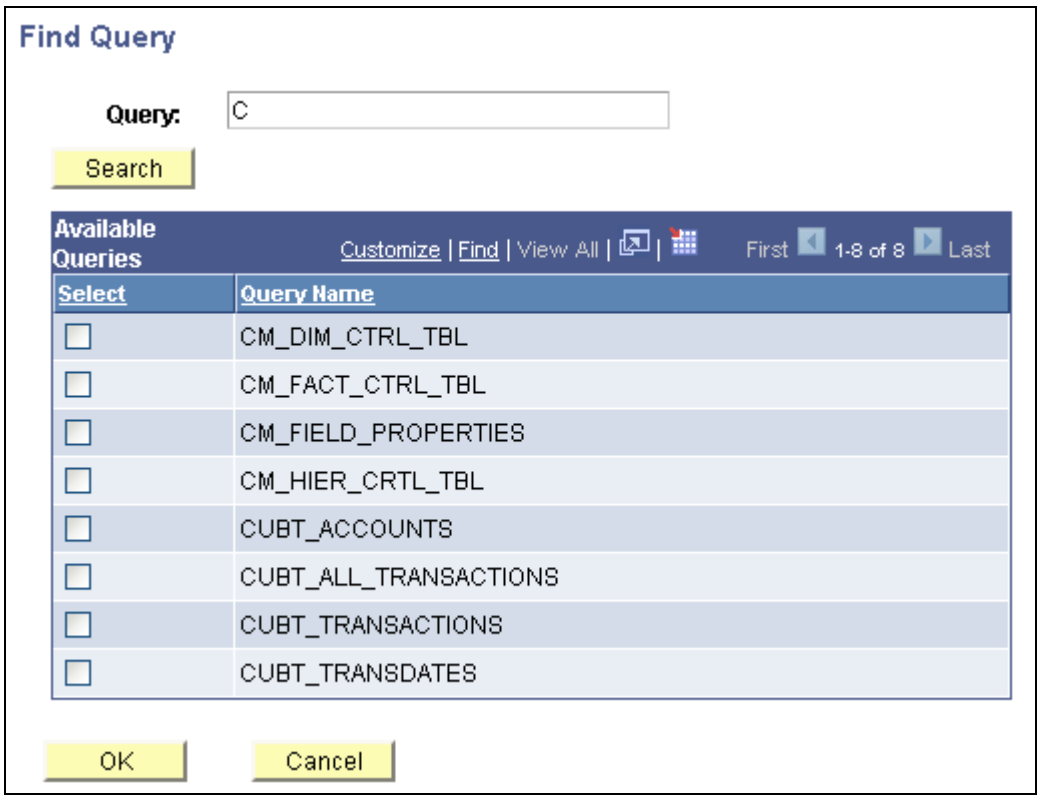
Save Click to save the outlines.

You can save only valid outlines that are ones in which each data source query conforms to all of the following rules:

- Only one column is mapped as the measure.
- One column is mapped to each dimension that is part of the current outline.
- Each dimension exists in the current database.
- No duplicate mappings of dimensions or to the measure exist.
- At least one dimension exists in the outline.
- At least one data source query is defined in the outline.
- All columns are mapped.

Searching for Query

Access the Find Query page (on the Data Sources page, click the Add Query link).



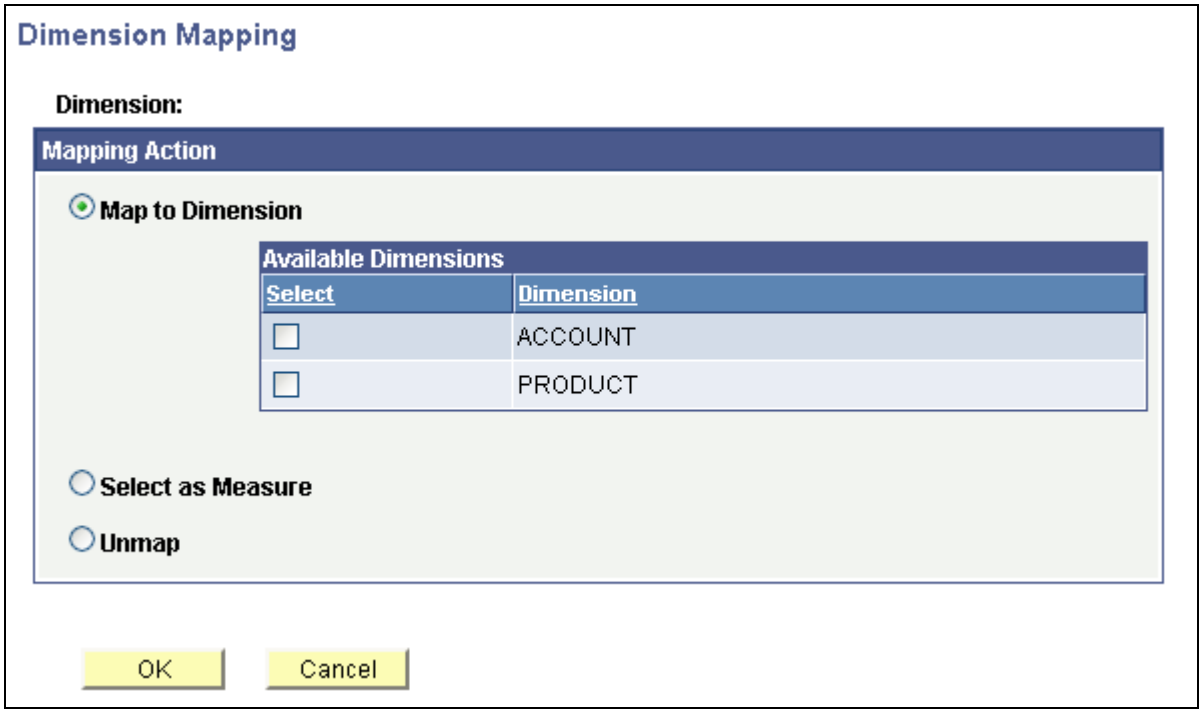
Find Query page

Available Queries Displays a list of existing queries that are defined in the system after you click the Search button.

Note. Only public queries to which the current user has authorization appear.

Mapping to Dimensions

Access the Dimension Mapping page (on the Date Sources page, click the No Dimension Mapped link for the selected outline heading).



Dimension Mapping page

Map to Dimension Select to populate the Available Dimensions region, where you can select a dimension to map to your query.

Select as Measure Select to define a column as a measure.

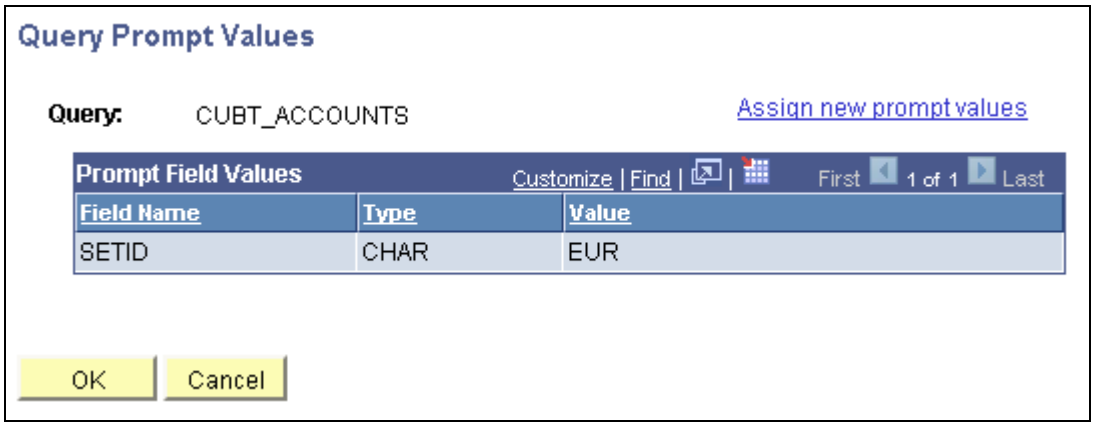
Note. Only one column can be selected as the measure.

Unmap Select to unmap a column that is already mapped to a dimension.

OK After mapping, click to return to the Data Sources page.

Inserting Query Prompts Values

Access the Query Prompt Values page (on the Date Sources page, click the Query Parameters link).



Query Prompt Values page

Assign new prompt values Click to access the New Prompt Values page, where you can change the input values of each query for each run.

Note. All changes on the New Prompt Values page are saved in the outline definition, so all subsequent runs will always use the current set of prompt values.

Prompt Field Values Displays all data source queries that are assigned to the outline.

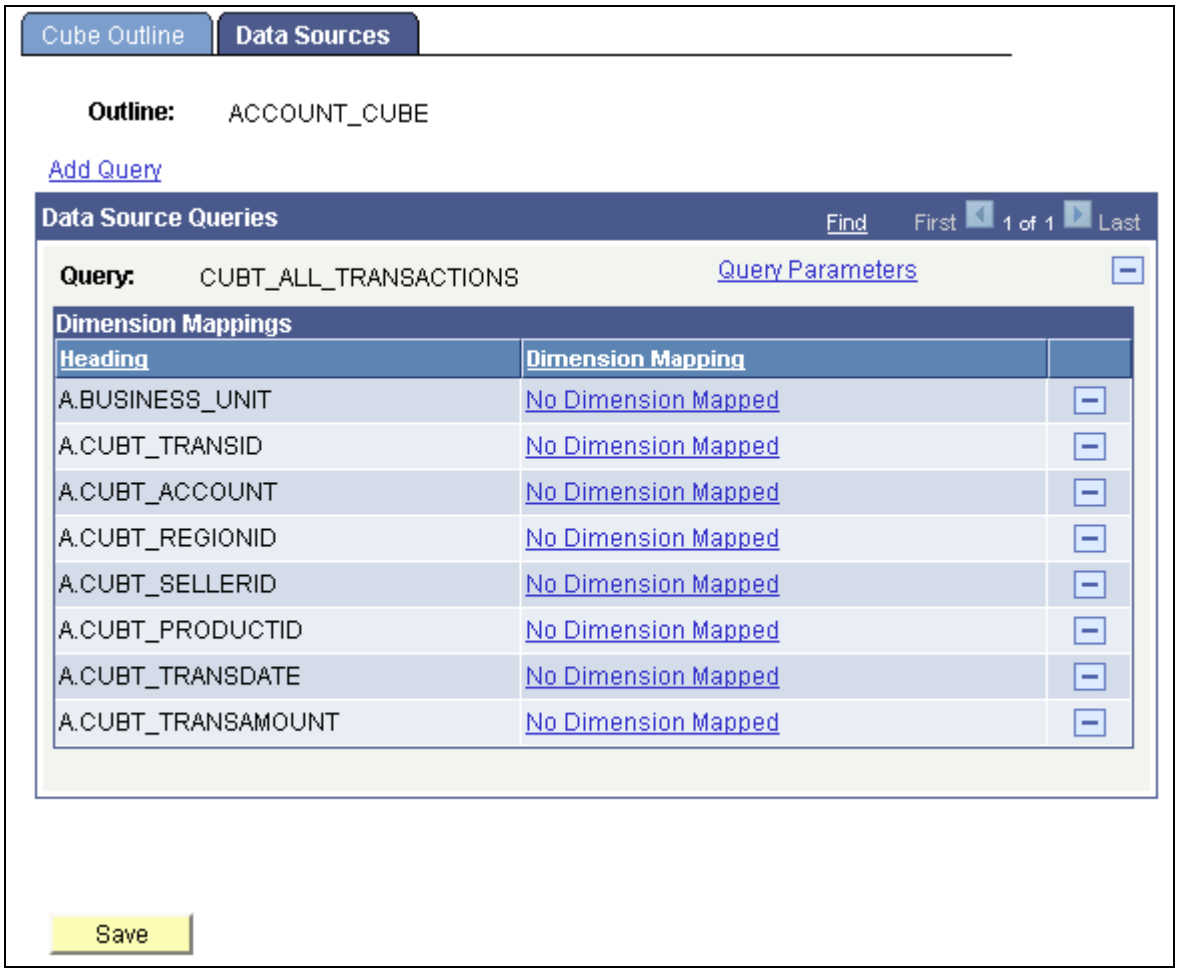
Example: Adding Cube Data Queries to a Cube Outline

After entering the desired dimensions using the Cube Outline page, you need to supply one final piece of key of information: a query to use to supply the cube contents. Until now, you have provided information to build the cube structure. Now you use the Data Sources page in the outline component to add the cube data queries.

Click the Add Query link to access the Find Query page, where you can select the desired query.

Note. On the Data Sources page, you can supply one or more queries to fill the cube.

In this example, you selected the CUBT_ALL_TRANSACTIONS query, which returns a full set of columns:



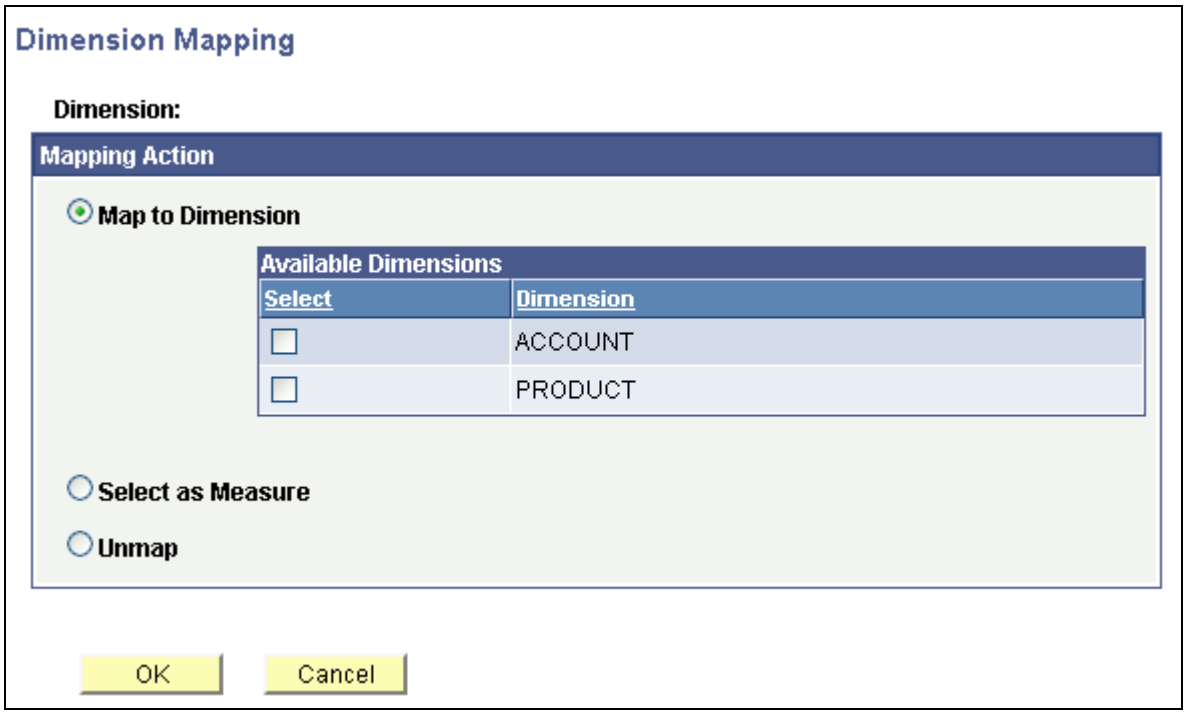
Data Sources page

The query returns a number of columns, which would be typical for a real-life scenario. In this example, each of these columns needs a dimension:

- Account—CUBT_ACCOUNT
- Region—CUBT_REGIONID
- Seller—CUBT_SELLERID
- Product—CUBT_PRODUCTID
- Time—CUBT_TRANSDATE
- Measure—TRANSMOUNT

Click the Delete Row button (minus sign) to remove the business unit (BUSINESS_UNIT) and transaction ID (CUBT_TRANSID) from the list because you do not need those two columns in this particular case.

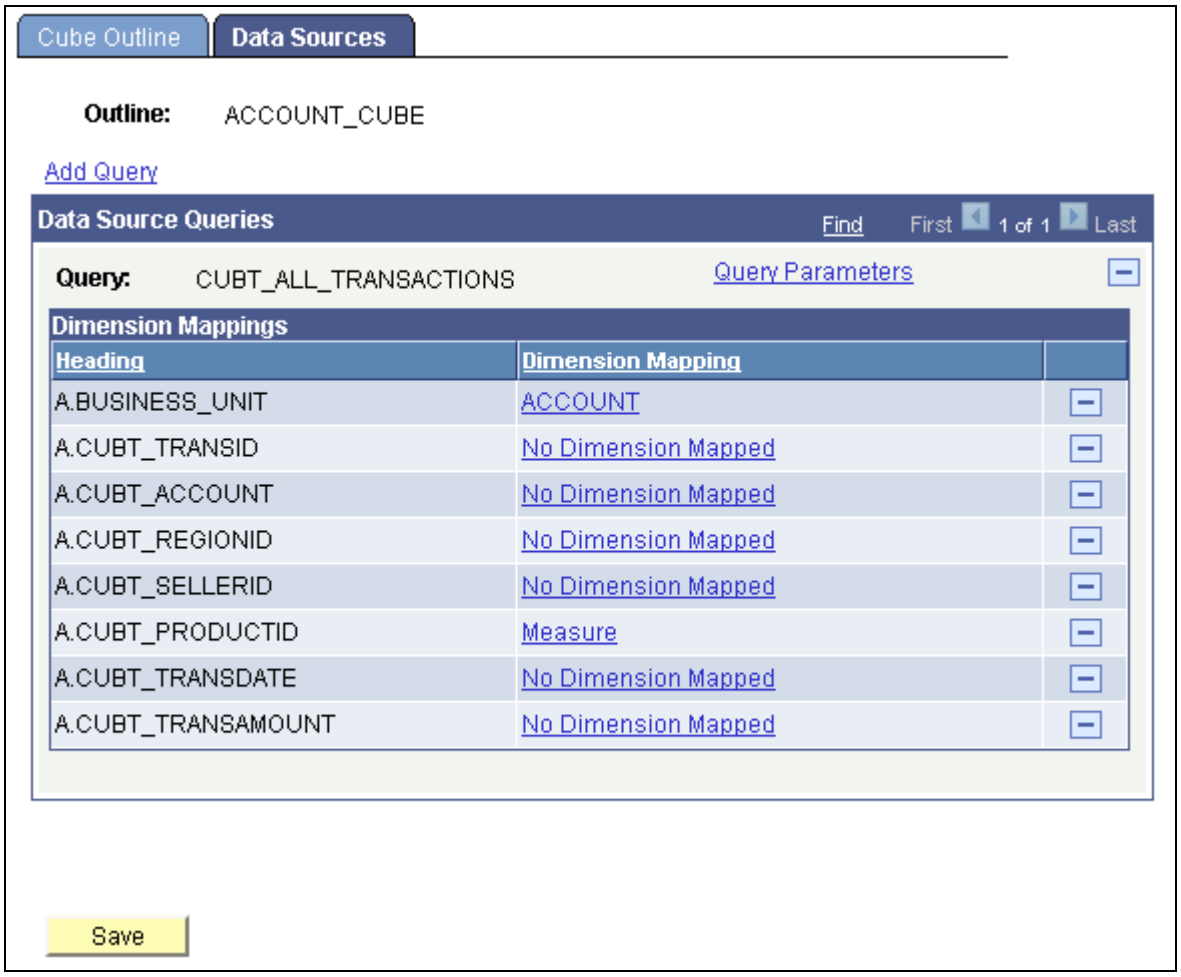
Click the No Dimension Mapped link to access the Dimension Mapping page, where you can map the column to a dimension:



Dimension Mapping page

Select the Map to Dimension option to map the column to a dimension, and click the OK button. The Data Sources page reappears.

This example illustrates the Data Sources page that has the BUSINESS_UNIT column mapped to the ACCOUNTS dimension and the CUBT_PRODUCTID column tagged as the measure of the outline:



Data Sources page with column mapped to dimension

Note. Only one column can be selected as the measure. For the outline to be valid, all remaining columns in the Data Source Queries section must be mapped to a dimension or tagged as the measure.

Chapter 6

Creating Dynamic Dimension Templates

This chapter provides an overview of dynamic dimension templates and discusses how to create dynamic dimension templates.

Understanding Dynamic Dimension Templates

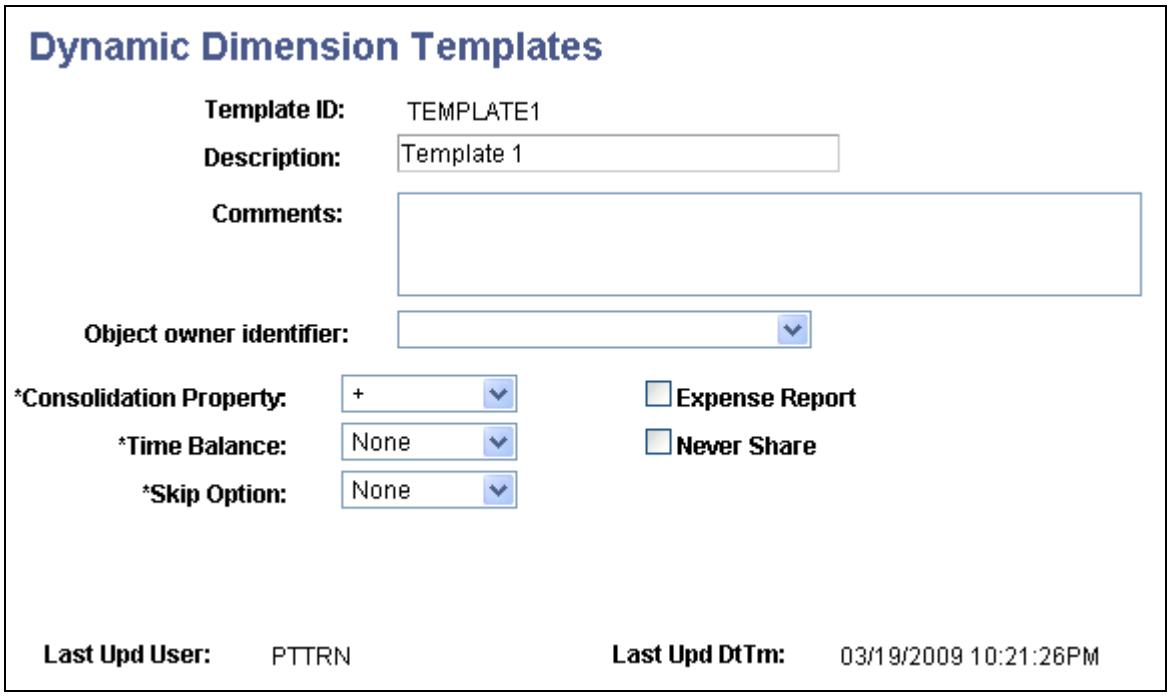
A dynamic dimension template is a set of default values to be used automatically for dynamic query and tree members. Because dynamic objects are not stored within the dimension, using a template enables the dimension builder to define what properties would be applied to the majority of members within the dynamic query and tree.

For members that are stored within the dimension—for example, having a dynamic query with all the consolidation properties in one location, and another dynamic query with all the consolidation properties in a different location—using templates enables you to set those values without setting them manually.

Using templates is optional. If you do not use templates, the system uses a default built-in template that assigns default values to each of the member's attributes. The default values are displayed in the Dynamic Dimension Templates page. If these default values will always be used, then templates should not be used.

Creating Dynamic Dimension Templates

Access the Dynamic Dimension Templates page (CUB_TEMPLATES) by selecting PeopleTools, Cube Builder, Essbase Cube Builder, Dynamic Dimension Templates.



Dynamic Dimension Templates page

Use the Dynamic Dimension Templates page to create Essbase dynamic dimension templates.

Object owner identifier Select the owner of the template.

The owner ID helps to determine the product, feature, or application team that last made changes to this template.

Consolidation Property Define the mathematical operator used for rolling up members. Most often, you expect that data is added (using the + operator) when rolled up. However, you might occasionally need to specify another operator.

See Chapter 4, "Creating Dimensions for Essbase Cubes," Defining an Essbase Dimension, page 28.

Expense Report Essbase has built-in formulas that take advantage of the knowledge that an item is an expense. To pass this knowledge on to Essbase, select this check box .

Time Balance Time balance affects how the parent time value is calculated. Select from these values:

- *0:* none
- *1:* first
- *2:* last
- *3:* average

Skip Option

If the Time Balance value is *first*, *last*, or *average*, then select a skip option that Essbase will use when it encounters missing values or 0 values.

Available options are:

- *Miss/Zero*
- *Missing*
- *None*
- *Zero*

Chapter 7

Building Essbase Cubes

This chapter discusses how to:

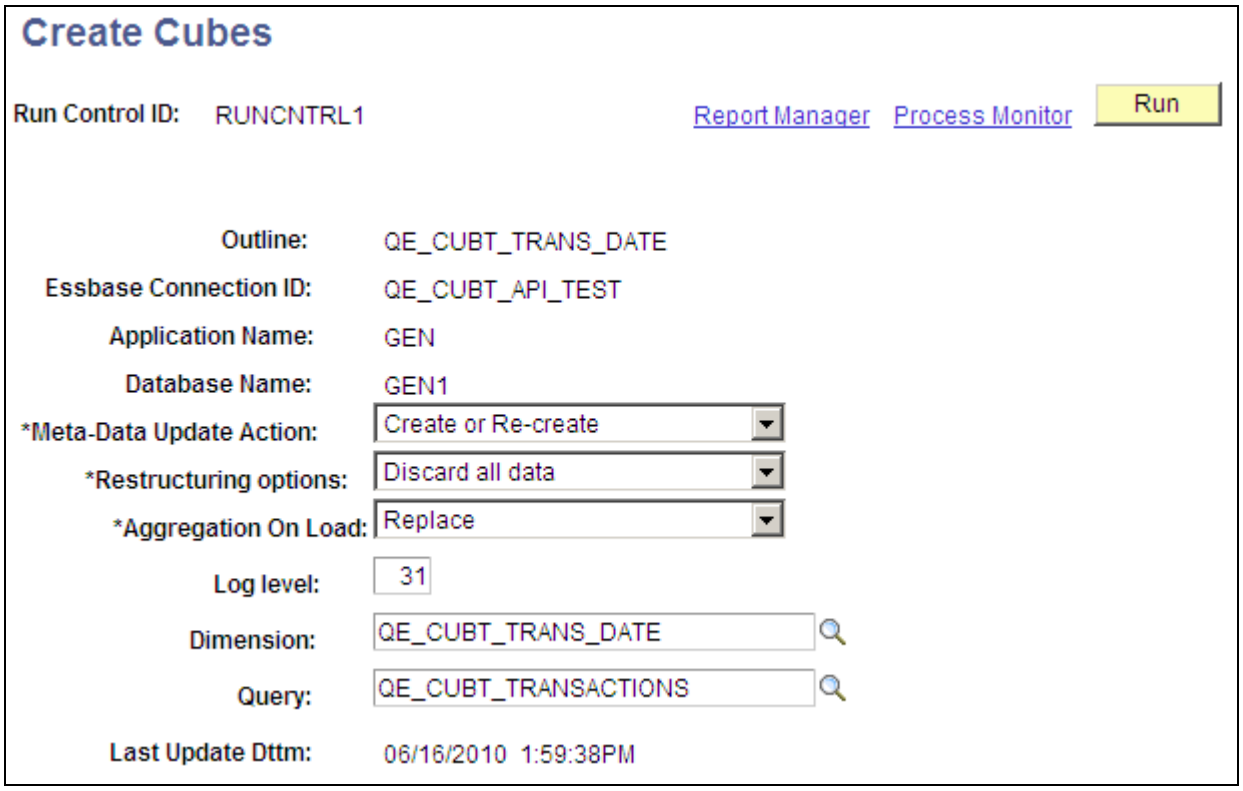
- Build Essbase cubes.
- Integrate with Oracle Smart View.
- Use application programming interface (APT) and command-line specifications.

Building Essbase Cubes

This section discusses how to create Essbase cubes:

Creating Essbase Cubes

Access the Create Cubes page (CUB_RUNCNTL) by selecting PeopleTools, Cube Builder, Essbase Cube Builder, Create Cube.



Create Cubes page

Use the Create Cubes page to run the process that sends all of the defined information to the Essbase database to build Essbase cubes.

Outline Displays the outline that is used to create this cube.

Essbase Connection ID Displays the Essbase connection ID that is used to create this cube.

Application Name Displays the Essbase application name that is used in the Essbase system to create the online analytical processing (OLAP) cube.

Database Name Displays the database name that is used in the Essbase system to create the OLAP cube.

Meta-Data Update Action Select an update action to use to build the metadata (the cube shape). The selected update action controls what to do in case this cube creation process is not the first time the cube is built.

Available options are:

- *Create or Re-create:* Create or recreate metadata from the beginning.
- *Incremental Replace All:* Update metadata incrementally and remove unspecified members.
- *Incremental Update:* Merge updates incrementally with existing metadata.
- *No Action:* Do not perform an action on the metadata.

Restructuring Options Select an option to build the data (the cube contents).

Available options are:

- *Discard all data:* Discard all previously loaded or manually modified data.
- *Keep all data:* Do not modify the data.
- *Keep only input data:* Keep only input data or data blocks created by data loading.
- *Keep only level 0 data:* Delete upper level data incrementally.
- *Reload all data:* Reload all data from its source.

Aggregations on Load Three available options are:

- Replace

  Select this option to overwrite or replace the currently stored value in the data cell with the value being passed. Basically, if the data file has multiple rows with the same dimensional intersection, then the last value in the data cell is stored and the previous ones are ignored.

- Add

  Select this option to add all the values for the stored data cell to the currently stored value. Use this option for instances in which loads are always additive, for example, an implementation that loads transactions to an already stored summary amount.

- Subtract

  Select this option to subtract the values passed from the currently stored value. This option is rarely used, but you can use it to perform an additive load that then needs to be backed out.

See Chapter 2, "Designing Cube Metadata," Aggregations on Load Tool, page 15 .

Log Level Enter the log level that pertains to the level of logging while the process is running.

These are the logging levels that can be selected to view specific messages or errors:

- *0* (eRequisite): no logging.
- *1* (eBasic): basic logging.
- *2* (eDetail): detailed logging.
- *4* (eDimensional): single dimension logging.
- *8* (eFactMapping): single factory logging.
- *16* (eAPITrace): Essbase APT traces.

For example, to see logging for Single Dimensions and Essbase APT, enter *20* (sum of eDimensional and eAPITrace = 4 + 16 = 20). To see all available logs, enter *31* (1 + 2 + 4 + 8 + 16 = 31).

Dimension Select a dimension as the single dimension that loads data.

This selection sets the data update action to *No Action.* The only action that will occur in the current run is for the structure of dimension to be rebuilt. No data will be loaded.

Query Select a query as the single query that loads data.

This selection sets the metadata action to *No Action.* While the process is loading in a single query, no structural changes are made to the cube.

Note. You should not provide both a dimension and a query because this selection would cause no actions to occur in the current run of the cube builder.

Last Update Dttm(last update date and time) Displays the date and time that the cube creation run control ID was last modified.

Run After saving the defined information, click this button to run the batch program.

See Also

PeopleTools 8.51 PeopleBook: PeopleSoft Process Scheduler, "Submitting and Scheduling Process Requests"

Integrating with Oracle Smart View

Using Oracle Smart View for Microsoft Excel, you can view the data and metadata of the recently built cube from Process Monitor. To view cube data using Smart View:

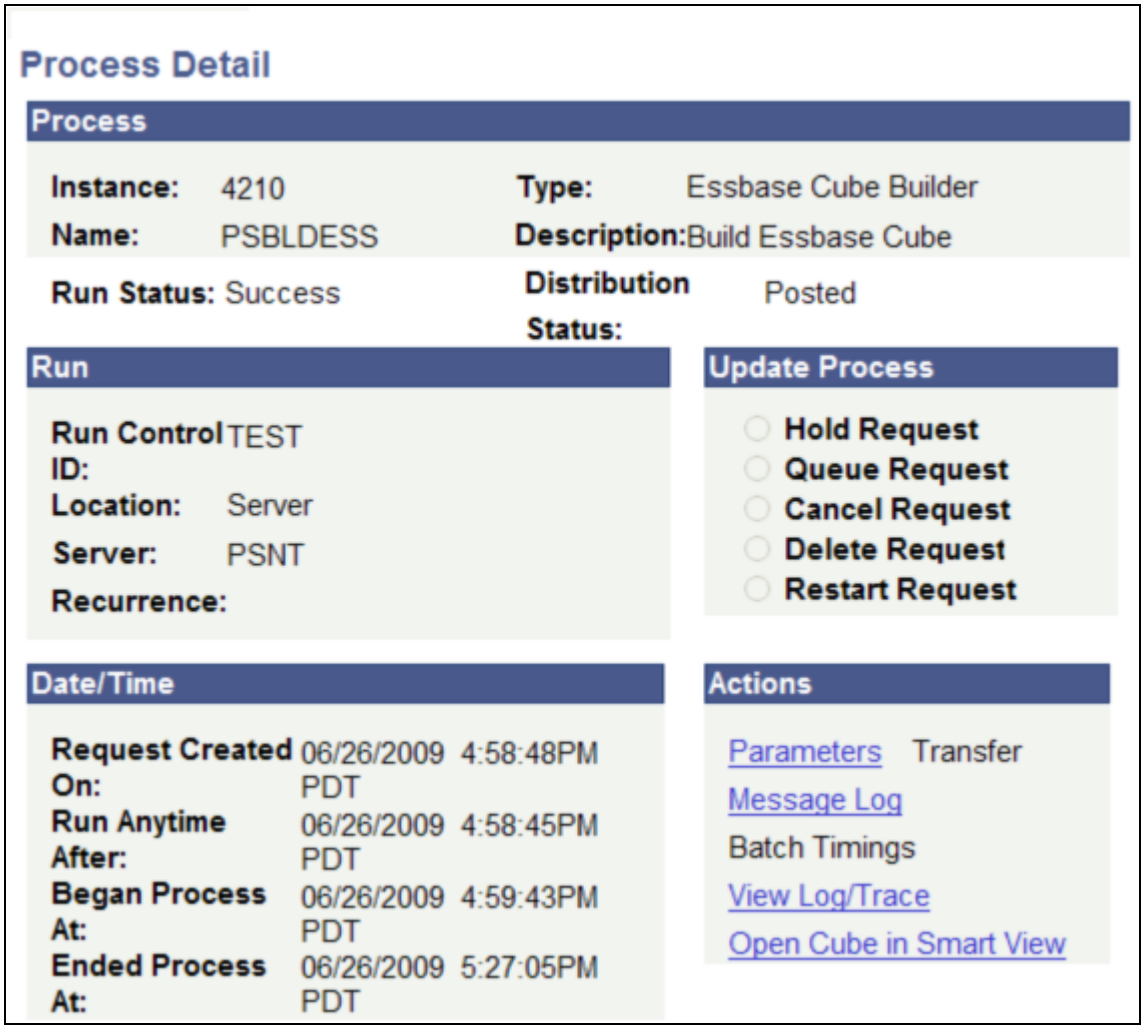
1. Build Essbase cube.

   See Chapter 7, "Building Essbase Cubes," Creating Essbase Cubes, page 73.

2. After successfully building an Essbase cube, click the Process Monitor link on the Create Cube page to access the Process List page.

3. Click the Details link for the selected process instance.

   If an Essbase cube was built successfully, the Open Cube in Smart View link is available on the Process Detail page, as shown in this example:

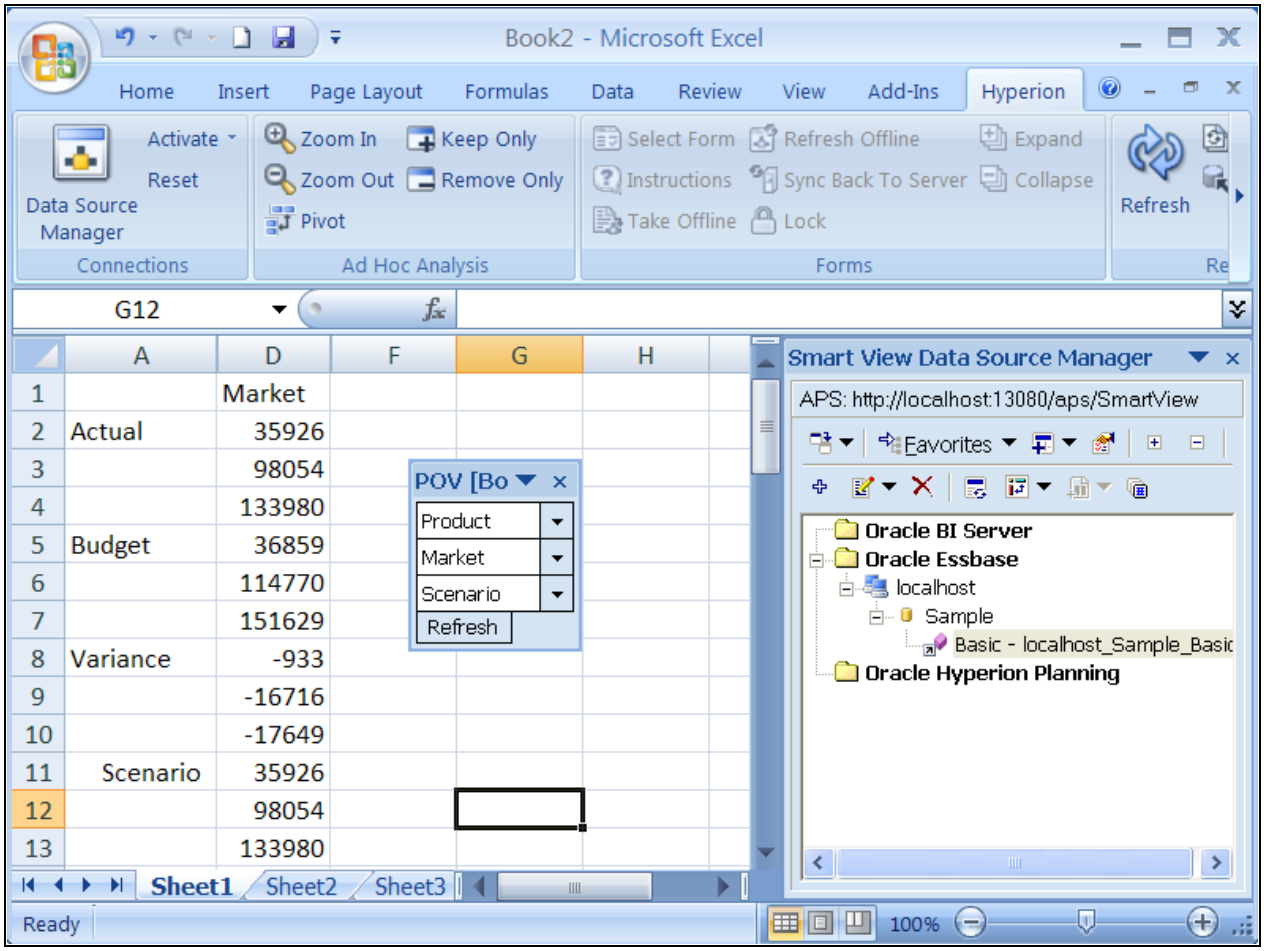


Example of the Process Detail page and the Open Cube in Smart View link

4. Click the Open Cube in Smart View link.

5. If required, enter the user name and password that was used to build the cube.

   If your user name and password are authorized, Smart View displays the top members of the two dimensions created, as shown in this example:



Example of Smart View displaying the top members of the two dimensions created

6. (Optional) Drill down or use the POV Smart View tool to manage the data.

Note. If you modify data or metadata using Smart View, these modifications will affect the cube that is stored in Essbase but will not affect the PeopleSoft tree or query used by PS2Essbase to create the cube.

If you make any modifications using Smart View, these modifications may be overwritten in the next run of PS2Essbase.

If multiple process instances of PS2Essbase were run using Process Scheduler, the Process List page displays only one Open Cube in Smart View link for the last cube built.

Using API and Command-line Specifications

You can run PS2Essbase from the Create Cube page using Process Scheduler or the command line.

This table lists the parameters that PS2Essbase uses when PS2Essbase runs from the command line:

Parameter	***Description***
A, a	Outline Name.
R, r	Run Control ID.
I, i	Process Instance ID number, such as *I42*, usually passed by Process Scheduler.
CT, ct	Database type (for example, *-CTORACLE*).
CD, cd	Database name (for example, *-CDPT850RC1*).
CO, co	Operator ID (for example, *-COPTDMO*).
CP, cp	Password (for example, *-CPPTDMO*).
EC, ec	Essbase Connection Name.
OP, op	Log files output destination. **Note.** When running PS2Essbase from the command line, in the –OP command line option, you must enclose the output destination patch in quotes. For example, *–OP "c:\tmp\ps"*.
M, m	Metadata action, such as *-mC:* • N - No action on metadata. • C - (Re)create metadata from scratch. • U - Incrementally merge updates with existing metadata. • R - Incrementally update existing metadata, remove unspecified members.
D, d	Outline Restructure option: • N - Keep all data. • R - Discard all data. • I - Reload all data. • D - Keep only level 0 data. • A - Keep only input data or data blocks created by data loading.
L, l	Logging level (for example, *L31*).

Parameter	*Description*
X, x (optional)	Dimension name for single dimension execution.
Y, y (optional)	PS Data Query name for single factory execution.
Z, z	Parameter used to load the aggregations on load option. Available options are: • R,r - Replace. • A,d - Addition. • S,s - Subtraction.

Example: the parameters list passed using this command line:

```
ps2essbase.exe -CX -CTORACLE -CDPT850RC1 -COPTDMO -CPPTDMO -I42 -OP "c:\tmp\ps" -
REMPLOYMENT -aEG_
DIVISION -mC -dR-L15 -XGL_ACCOUNT -YQRY_MEASURES
```

- Run Control ID = EMPLOYMENT
- Outline = EG_DIVISION
- Metadata Action = Create

Note. The log files will be deposited in the –OP location. For this example, the –OP location is *"c:\tmp\ps"*.

- Restructure Option = Discard all data

  These metadata and restructure options indicate that metadata will be fully recreated or created if it did not exist, and all previous data, if it existed, will be discarded.

- Logging Level Basic, Detail, Member, Fact map logging, we specified: L15, where 15 = 1 (Basic) + 2 (Detail) + 4 (Member) + 8 (Fact).
- Single Dimension = GL_ACCOUNT
- Single Data Query = QRY_MEASURES

Logging

You can pass the log level with the L option to the command line of psolap.exe; for example, L2 or L6, and so on.

This table lists the log level and the data recorded in each log level:

Log Level	*What is recorded*
1	Basic logging
2	Detail logging

Log Level	*What is recorded*
4	Dimension member logging
8	Fact map logging
16	API logging

When you run the process using Process Scheduler, the logging level is set on the Create Cube page. When you run the process from the command line, the logging level is set using the –L parameter. To calculate these logging settings, PeopleSoft Cube Builder adds the options that you define. For example:

- To see logs for Single Dimensions and Essbase API, enter `20`.

  `20` is the sum of Dimension member logging + API logging = `4+16 = 20`.

- To see all the logs that are available, enter `31`.

  `31` is the sum of Basic logging + Detail logging + Dimension member logging + Fact map logging + API logging = `1+2+4+8+16 = 31`.

Chapter 8

Securing Cubes

This chapter discusses how to secure Cube Builder cubes.

Securing Cube Builder Cubes

This section discusses how to:

- Control user operations.
- Set user actions.
- View content references.

Pages Used to Secure Cube Manager Cubes

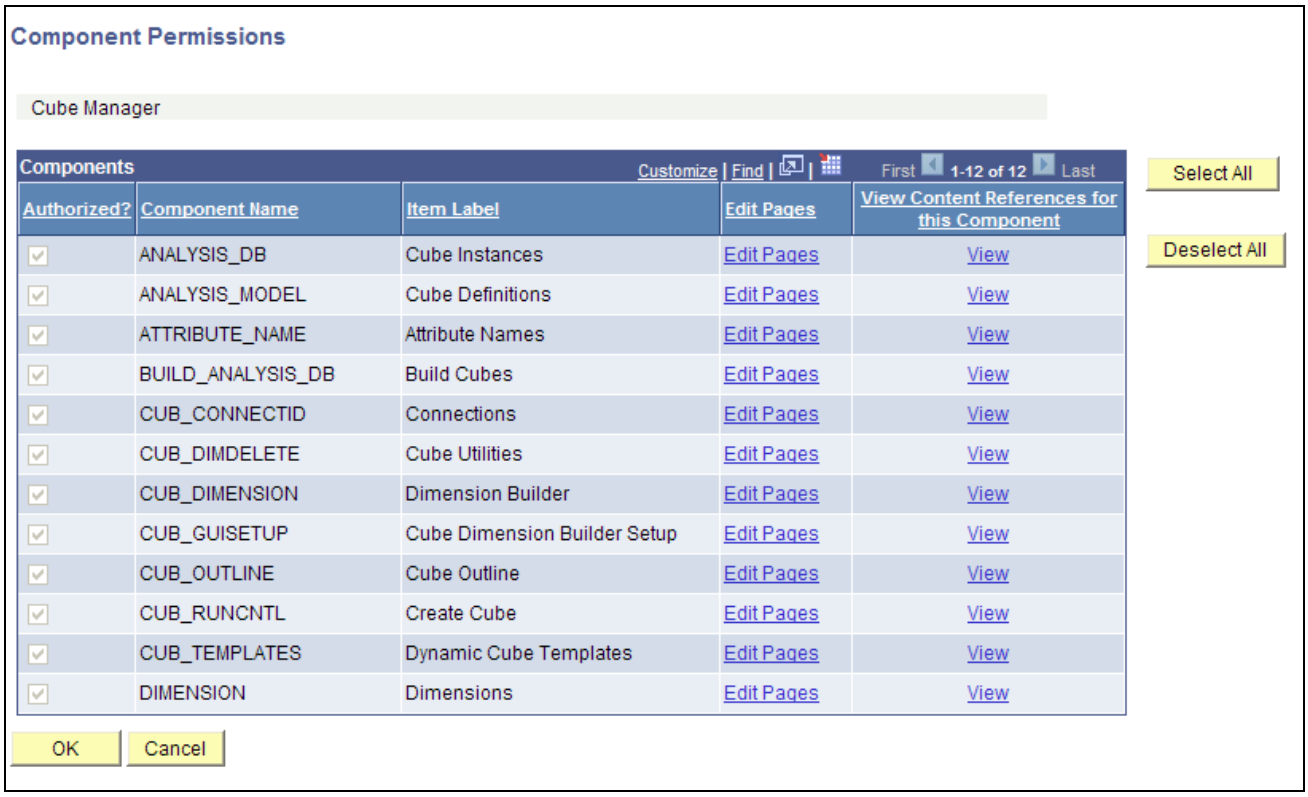
Page Name	*Definition Name*	*Navigation*	*Usage*
Component Permissions	ACL_COMPONENT2	PeopleTools, Security, Permissions & Roles, Permission Lists Create a new permission list or search for an existing one. Select the Pages tab and then click the appropriate Edit Components link.	Control the operations that a user is allowed to perform within Essbase Cube Builder.
Page Permissions	ACL_PAGES2	PeopleTools, Security, Permissions & Roles, Permission Lists Create a new permission list or search for an existing one. Select the Pages tab and click the Edit Components link. Click the Edit Pages link.	Set the actions that a user can complete on a page.

Page Name	*Definition Name*	*Navigation*	*Usage*
Content References	PLIST_CREF	PeopleTools, Security, Permissions & Roles, Permission Lists Create a new permission list or search for an existing one. Select the Pages tab and click the Edit Components link. Click the View link.	View all the content references in the database that point to the component.

Controlling User Operations

Complete these steps to access the Component Permissions page:

1. Select PeopleTools, Security, Permissions & Roles, Permission Lists.
2. Add a new permission list or search for an existing one.
3. Select the Pages tab and then click an appropriate Edit Components link.



Component Permissions page

Authorized? Displays the components to which the current permission list has access.

Component Name Displays the name of components beneath the authorized menu. PeopleSoft Cube Builder components are:

- CUB_CONNECTID, which is the Connections component.

  (Select PeopleTools, Cube Builder, Essbase Cube Builder, Connections.)

- CUB_DIMDELETE, which is the Utilities component.

  (Select PeopleTools, Cube Builder, Essbase Cube Builder, Utilities.)

- CUB_DIMENSION, which is the Dimensions component.

  (Select PeopleTools, Cube Builder, Essbase Cube Builder, Dimensions.)

- CUB_GUISETUP, which is the Cube Dimension Builder Setup component.

  (Select PeopleTools, Cube Builder, Essbase Cube Builder, Cube Dimension Builder Setup.)

- CUB_OUTLINE, which is the Outlines component.

  (Select PeopleTools, Cube Builder, Essbase Cube Builder, Outlines.)

- CUB_RUNCNTL, which is the Create Cube component.

  (Select PeopleTools, Cube Builder, Essbase Cube Builder, Create Cube.)

- CUB_TEMPLATES, which is the Dynamic Dimension Templates component.

  (Select PeopleTools, Cube Builder, Essbase Cube Builder, Dynamic Dimension Templates.)

Item Label Displays the menu item label that you click to access a component.

Edit Pages This link appears for every component listed under the current menu.

Click to access the Page Permissions page, where you can set the actions that a user can complete on a page.

See Chapter 8, "Securing Cubes," Setting User Actions, page 87.

View Content References for this Component This link appears for every component listed under the current menu.

Click the View link to access the Content References page, where you can view all the content references in the database that point to the component.

See Chapter 8, "Securing Cubes," Viewing Content References, page 88.

Select All Click to grant access to all or selected items.

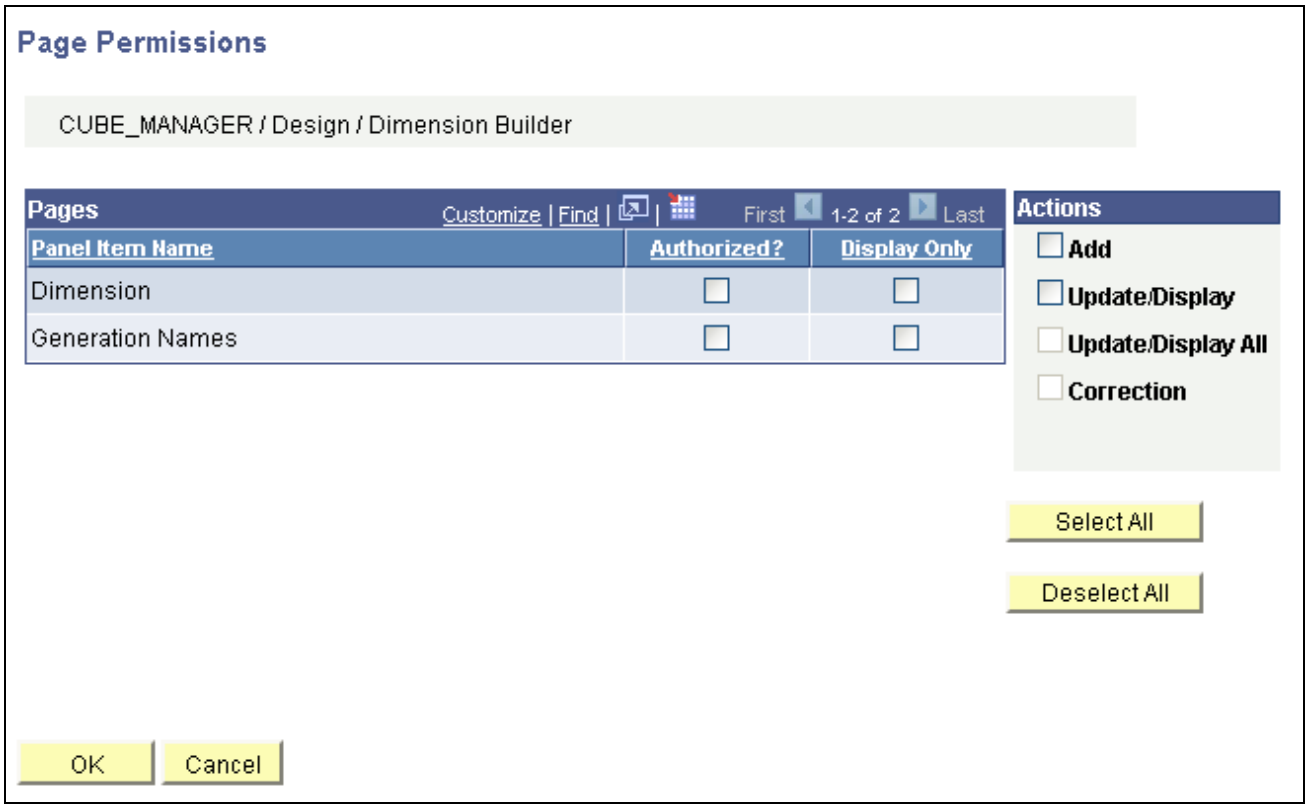
To grant access to *most* menu items, click this button and then clear the items to which you do not want to grant access.

Deselect All Click to deselect items that were previously selected.

Setting User Actions

Complete these steps to access the Page Permissions page (ACL_PAGES2):

1. Select PeopleTools, Security, Permissions & Roles, Permission Lists.
2. Add a new permission list or search for an existing one.
3. Select the Pages tab and then click an appropriate Edit Components link.
4. Click an appropriate Edit Pages link.



Page Permissions page

Panel Item Name Lists the pages of the selected component.

Authorized? Select to enable a user to access the page.

After selecting this option, you must decide the degree to which a user is authorized on a page by selecting the Display Only option or at least one of the other available options in the Actions section.

Display Only Select this option to enable the user to view the information on the page but not to modify any of the data.

To enable write access to a page, deselect this option.

Actions To allow users to modify data on the page, select one option from those that appear in the Actions section, such as *Add*,*Update/Display*, and *Correction.*

The options that are available in the Actions section depend on the options that were selected when the page was initially developed in PeopleSoft Application Designer.

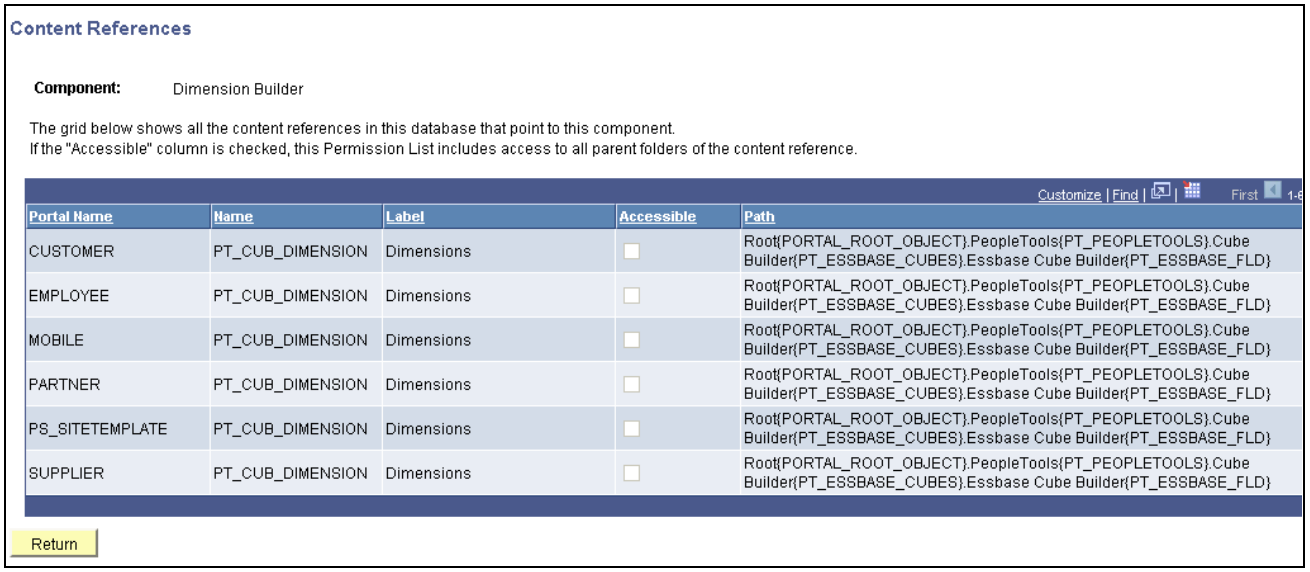
Select All Click to grant access to all pages and to all the actions for each page.

Deselect All Click to deselect all previously selected items.

Viewing Content References

Complete these steps to access the Content References page:

1. Select PeopleTools, Security, Permissions & Roles, Permission Lists.
2. Add a new permission list or search for an existing one.
3. Select the Pages tab and then click an appropriate Edit Components link.
4. Click an appropriate View link.



Content References page

The Content References page displays all of the content references in the database that point to the selected component. If the Accessible option is selected, then the associated permission list includes access to all parent folders of the content reference.

See Also

PeopleTools 8.51 PeopleBook: Security Administration, "Setting Up Permission Lists"

Chapter 9

Maintaining Essbase Cubes

This chapter discusses how to maintain Essbase cubes using the Essbase Utilities component (CUB_DIMDELETE).

Maintaining Essbase Cubes

This section discusses how to:

- Delete dimensions.
- Delete outlines.
- Delete run control IDs.
- View dynamic objects.
- View outline structures.
- Expand dimensions.

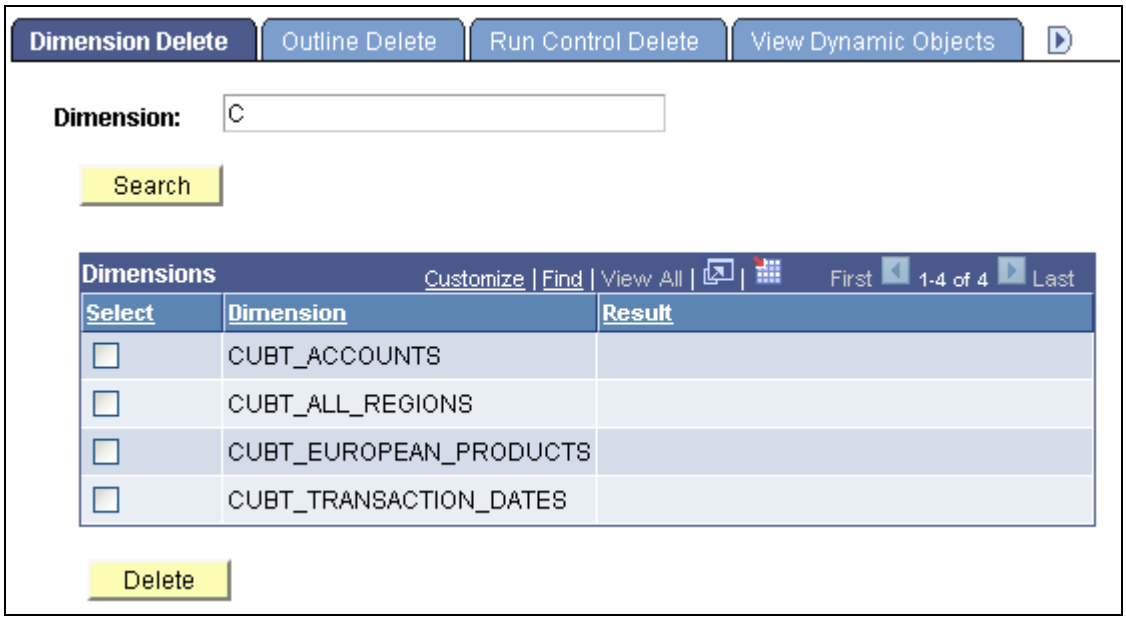
Pages Used to Maintain Essbase Cubes

Page Name	*Definition Name*	*Navigation*	*Usage*
Dimension Delete	CUB_DIMDELETE	PeopleTools, Cube Builder, Essbase Cube Builder, Utilities	Delete any dimension created in the system as long as the dimension is not referenced in any outline.
Outline Delete	CUB_OUTDELETE	PeopleTools, Cube Builder, Essbase Cube Builder, Utilities On the Dimension Delete page, select the Outline Delete tab.	Delete any outline created in the system as long as the outline is not referenced in any cube creation run control.

Page Name	*Definition Name*	*Navigation*	*Usage*
Run Control Delete	CUB_RUNDELETE	PeopleTools, Cube Builder, Essbase Cube Builder, Utilities On the Dimension Delete page, select the Run Control Delete tab.	Delete any cube creation run control.
View Dynamic Objects	CUB_DIMDYNVIEW	PeopleTools, Cube Builder, Essbase Cube Builder, Utilities On the Dimension Delete page, select the View Dynamic Objects tab.	View all dynamic objects (queries and trees) that are used in the definition for the selected dimension. View any runtime parameters that are used when you run queries. View the queries and trees that are part of the dimensional structure if you are having problems opening the dimension definition. Diagnose permission problems with dynamic objects.
View Outline Structures	CUB_OUTSTRUCT	PeopleTools, Cube Builder, Essbase Cube Builder, Utilities On the Dimension Delete page, select the View Outline Structures tab.	View all the dimensions that are part of the outline for the selected outline.
Outline Expansion	CUB_DYNEXPAND_SEC	PeopleTools, Cube Builder, Essbase Cube Builder, Utilities On the Dimension Delete page, select the Outline Expansion tab.	Perform the full dimension expansion for every dimension that is a part of the selected outline. Run all dynamic queries and trees in each dimension, and display the total number of rows processed for each dynamic object.

Deleting Dimensions

Access the Dimension Delete page by selecting PeopleTools, Cube Builder, Essbase Cube Builder, Utilities.

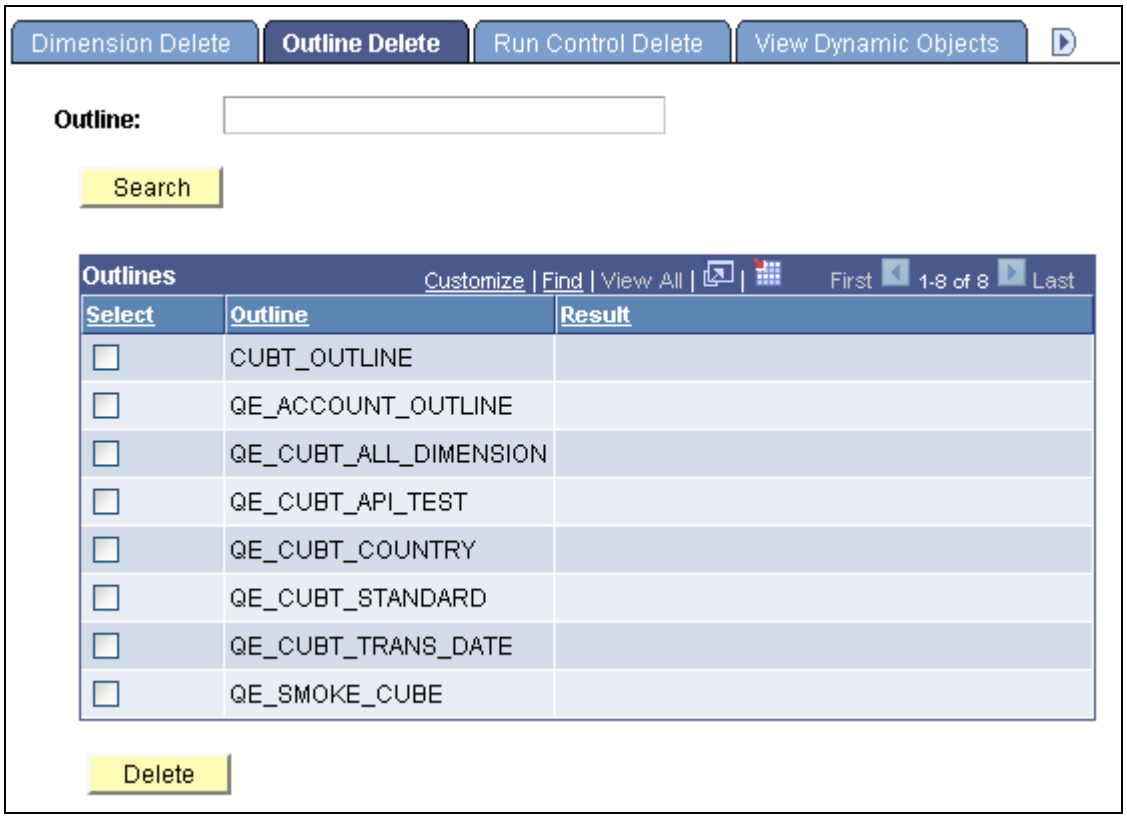


Dimension Delete page

Use the Dimension Delete page to delete any created dimension in the system as long as the dimension is not referenced in any outline.

Deleting Outlines

Access the Outline Delete page (on the Dimension Delete page, select the Outline Delete tab).

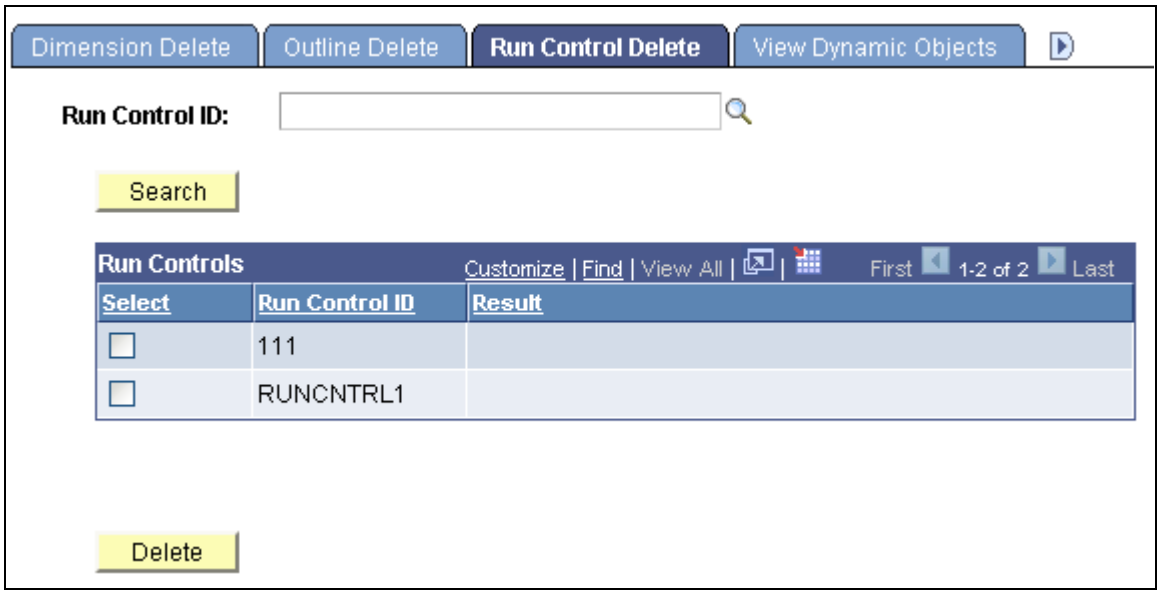


Outline Delete page

Use the Outline Delete page to delete any created outline in the system as long as the outline is not referenced in any cube creation run control.

Deleting Run Control IDs

Access the Run Control Delete page (on the Dimension Delete page, select the Run Control Delete tab).

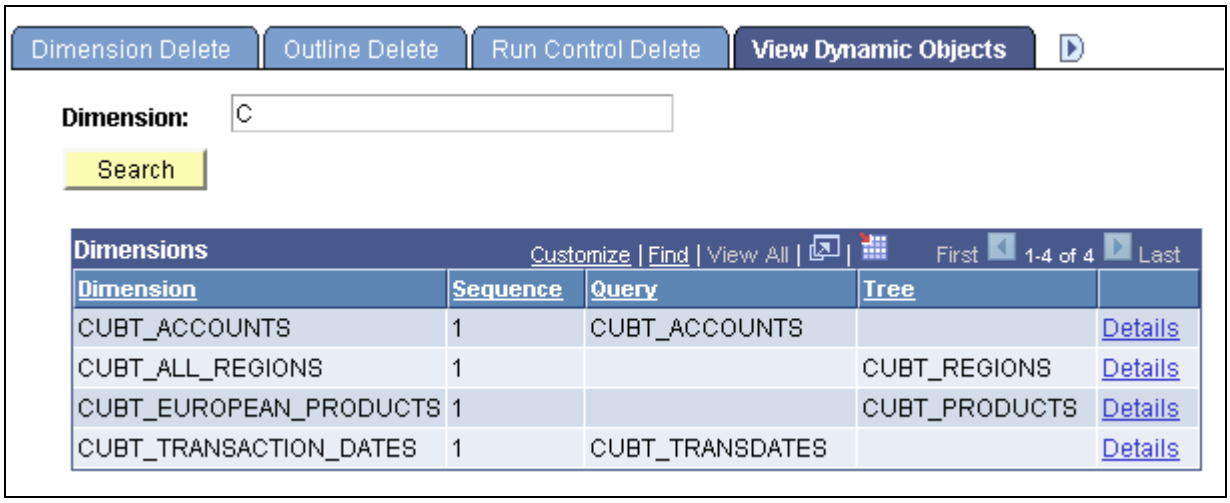


Run Control Delete page

Use the Run Control Delete page to delete any cube creation run control.

Viewing Dynamic Objects

Access the View Dynamic Objects page (on the Dimension Delete page, select the View Dynamic Objects tab).



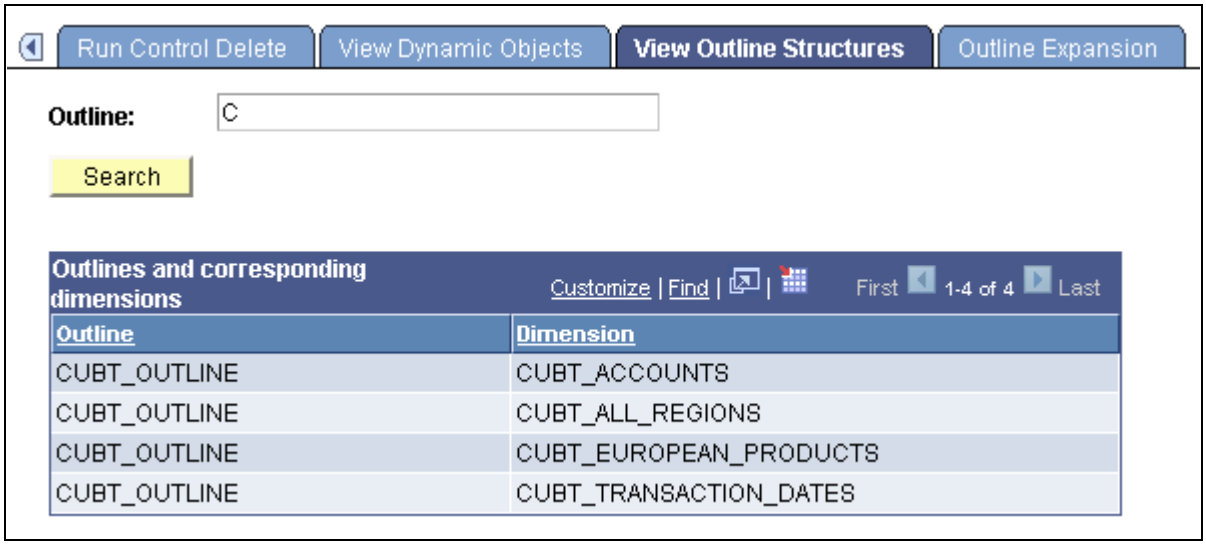
View Dynamic Objects page

Use the View Dynamic Objects page for the selected dimension to view all dynamic objects (queries and trees) that are used in the definition. This page also displays runtime parameters that are used when you run queries.

If you are having problems opening the dimension definition, you can view the queries and trees that are part of the dimensional structure. This page is useful in diagnosing permission problems with dynamic objects.

Viewing Outline Structures

Access the View Outline Structures page (on the Dimension Delete page, select the View Outline Structures tab).

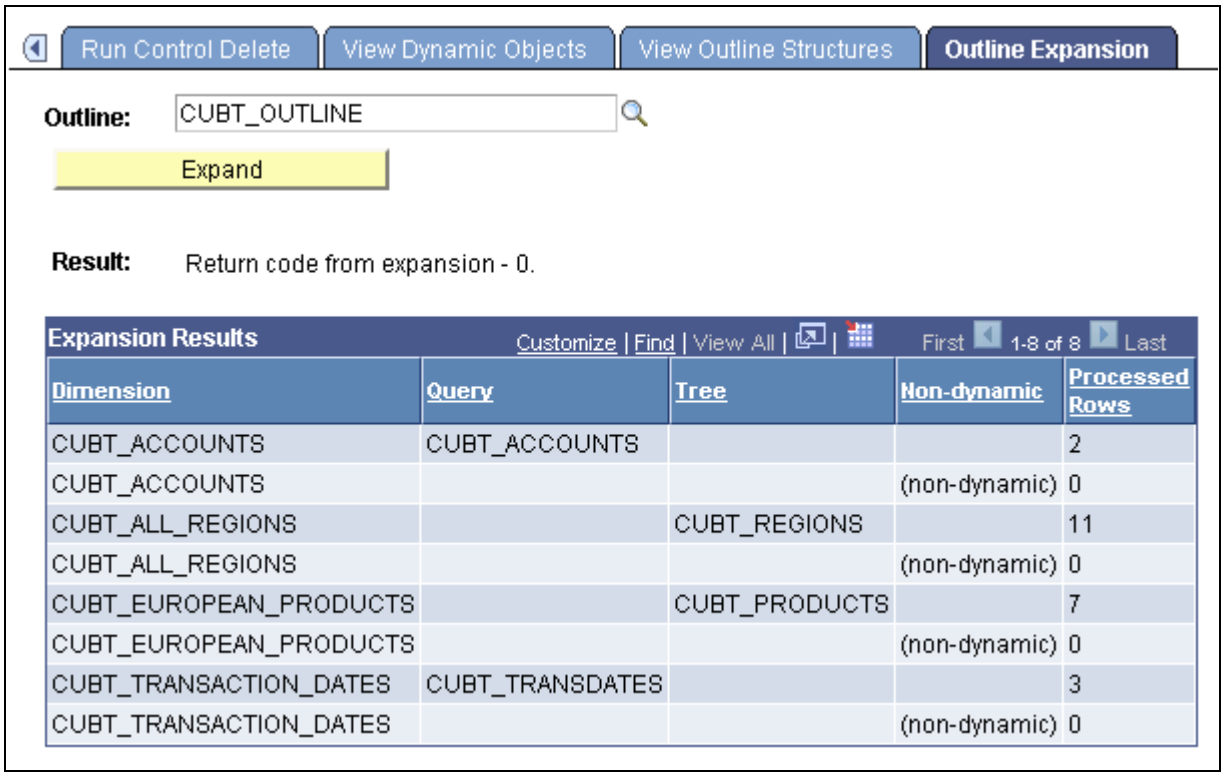


View Outline Structures page

Use the View Outline Structures page for the selected outline to view all the dimensions that are part of the outline.

Expanding Dimensions

Access the Outline Expansion page (on the Dimension Delete page, select the Outline Expansion tab).



Outline Expansion page

Use the Outline Expansion page to perform the full dimension expansion for every dimension that is part of the given outline. This page runs all dynamic queries and trees in each dimension and displays the total number of rows processed for each dynamic object.

For nondynamic members of the dimension, this page shows an overall total only. All errors encountered during the expansion appear, along with relevant information.

Appendix A

Viewing Query Results That Have Large Result Sets

This chapter discusses:

- Query chunking and the chunking class.
- Dynamic query expansion.

Query Chunking and the Chunking Class

Query chunking provides a valuable methodology for displaying query run results of queries with very large result sets.

Using application package class `PT_CUBQUERYCHUNK:QueryChunker` enables you to display query result sets as frames of rows. The number of rows in a frame can be configured to be between 10 and 1000. This chunking object maintains an internal buffer of 10 frames and it enables the user to navigate the query results frame by frame, not as it refreshes the internal buffer dynamically during navigation.

During navigation, the query is opened only as needed and is closed after the relevant rows are retrieved into the internal buffer area. No open cursors are on the query object during navigation.

To instantiate a chunking object, you would run the following code:

```
&NewQueryChunk = create PT_CUBQUERYCHUNK:QueryChunker(&myrecordname, &myseqnum,
 &qpromptrec, &COMP_FRAMESIZE, &fheading);
```

Instantiation requires a query name, a unique sequence number, the prompt record associated with the query (if any), the frame size desired, and a select column heading. This last parameter is used to uniquely identify a select column from the query definition. The query chunker application supports only a single column from the select clause of the query being chunked. The frame size must be between 10 and 1000. If higher or lower values of the frame size are passed in, the number is modified internally to meet this requirement.

Post instantiation, the validity of the instantiation must be checked as shown here:

```
If Not &NewQueryChunk.valid Then
 /*report an error here */
```

The class also contains two properties to report error conditions: `errorcode` and `erroropencode`. The second property can be checked for any query open error. It reports if the query does not exist or if the user does not have permission to access the query.

If the process is working fine, then this code can get a reference to the current frame:

```
&retarray = &NewQueryChunk.GetFrame();
```

This table lists the error codes for the chunker:

Code	*Error*
-1	Missing query name.
-2	Missing field heading.
-3	Error opening the query. Check `erroropencode` for more information.
-4	Mismatch between the prompt record that was passed in and the current query definition prompt values.
-5	Unable to find the field heading that was passed in within the current query definition.
-6	Error reopening query for a new chunk.

This chunking capability can be used anywhere for any query. Page CUB_QUERYNAV_SEC can be added to any component to display chunking results.

These are the rules to use the CUB_QUERYNAV_SEC page:

1. The following objects must be defined before you access the page:

   Component string `&DYN_QUERYNAME;`

   Component number `&DYN_SEQNUM;`

   Component `PT_CUBQUERYCHUNK:QueryChunker &cChunker;`

   These values hold the query name and the unique sequence number. Remember that the sequence number is used to uniquely identify the query.

   Some components could potentially be using the same query multiple times; the sequence number is used to uniquely identify a query instance. The page activate code makes sure that the current chunking object matches the current query and sequence number that were passed in.

2. The rowset in the CUB_QUERYNAV_SEC page is populated with the current frame of the chunking object as the page is displayed.

   If this is the first time the chunking object is displayed, then the first frame is shown. This same rowset could be referenced in the calling component.

   ```
   &rs = GetLevel0().GetRow(1).GetRowset(Scroll.PSCUBCHUNKING);
   ```

   You can navigate back and forth within the chunking page. When the secondary page is dismissed, the rowset contains the current frame. You could also just get the current frame from the chunking object itself.

   ```
   &retarray = &cChunker.GetFrame(); /* Get the current frame. */
   &cframe = &cChunker.currentframe; /* Get the current frame number. */
   ```

   On the CUB_DIMENSION component, an array of chunking classes is instantiated upon component load. Each dynamic query results in a new entry in this array. When you use chunking, the array is traversed to find the correct chunking object to pass into the secondary page. Object `&cChunker` is set to the appropriate entry from the array and the secondary page then can navigate back and forth.

Dynamic Query Expansion

Application class `PT_CUBQUERYCHUNK:Utilities:ExpandStructure` is used to expand dynamic queries from dimension definitions. The dimension definition holds values only for dynamic query entries to which you have added new information that is, information not found as a default value for the dimension members.

During cube population, the query is rerun and its members extracted to always send to Essbase the most up-to-date member list. This expansion of dynamic queries is completed with this class, which is called in the following way:

```
&ExpandStruct = create PT_CUBQUERYCHUNK:Utilities:
ExpandStructure(PSCUBWRK2.CUB_OUTLINEID, "");
```

The first parameter is the outline to expand. This parameter expands every dimension in the outline. Alternatively, you can expand a single dimension by leaving the first parameter blank and passing in the dimension ID in the second parameter.

Post expansion, the return code of the expansion should be checked in the following way:

```
If &ExpandStruct.errorcode <> 0 then
 /* report error */
```

Message catalog entry 79,1103 contains the current list of expansion error codes. If new codes are added, this entry should be kept up to date.

These tables include the current codes:

Code	***Error***
-21	Error opening a query.
-22	Error retrieving presaved prompt values for a query.

Code	Error
-23	Error obtaining selected column for a query.
-42	Error tagging an entry in the internal dynamic buffer for a query.
-30	Security error on a tree definition.
-31	Error opening a tree.
-32	Error finding the required root node on a tree definition.
-41	Error: found dynamic tree leaf.
-43	Error tagging an entry in the internal dynamic buffer for a tree.

/* Leaf SQL Errors */	Error
-51	Empty tree structure name.
-52	Invalid tree structure.
-53	Empty detail search record.
-54	Empty detail field name.

/* Duplicate checks */	Error
-101	Level 0 members with same parent and identical names.
-102	Invalid shared member reference. Either the first duplicate name had the shared option selected, or a subsequent duplicate name did not have the shared option selected. Shared members must reference a prior nonshared member.

The expansion routing populates table PSCUBDIMSTRCOUT based on the dimension structural information found in table PSCUBDIMSTRUCT. The latter table contains references to dynamic queries and any of the saved override values for specific members.

After the dimension is expanded, PSCUBDIMSTRCOUT will contain a row for every returned row for every dynamic query, so it can grow quite large. Every time a dimension is expanded, any rows from prior runs of the expansion routine are purged. Because this table can grow quite large, its contents should not be displayed on a regular PIA page.

A good example of PeopleCode used to expand an outline can be seen in the Expand Outline utility page, as described previously.

For the actual process of creating cubes, the C++ program PS2ESSBASE calls the expansion class to always perform a clean expansion prior to sending in anything to Essbase.

Appendix B

Using Essbase Cube Builder Demo Data

This chapter provides an overview of Essbase Cube Builder demo data and discusses how to:

- Apply project CUBE_DEMO_PROJ.
- Grant permissions to all menu CUBE_TEST components.
- Import PS_CUBEBUILDER.DAT file using Data Mover script PS_CUBEBUILDER.DMS.
- Grant query security.
- Add data to tables.
- Use sample dimensions and outlines.

Understanding Essbase Cube Builder Demo Data

Essbase Cube Builder demo data is being provided as part of PeopleTools 8.50 so that you can get an idea of the structures involved in creating cubes.

Project CUBE_DEMO_PROJ is delivered in the PROJECTS folder of the installation. Data mover and data files, ps_cubebuilder.cat and ps_cubebuilder.dms, are also being delivered. These files load the necessary data to show prebuilt dimensions and outlines as well as demo data that you can add to, as needed.

Applying Project CUBE_DEMO_PROJ

Project CUBE_DEMO_PROJ contains tables for a cube test suite. This project also includes a new menu—CUBE_TEST—and portal registry entries for a new folder and components. All demo-date portal-registry entries appear under the Essbase Cube Builder folder.

Project CUBE_DEMO_PROJ also includes queries CUBT_ACCOUNTS, CUBT_TRANSACTIONS, CUBT_TRANSDATES, and CUBT_TRANS_ALL.

After importing project CUBE_DEMO_PROJ, create all tables and then build the view PSCUBTTRANSD_VW.

Project CUBE_DEMO_PROJ is delivered in the PROJECTS folder as part of the PeopleTools 8.50.

Granting Permissions to All Menu CUBE_TEST Components

Granting permissions to all menu components is often completed to permission list PTPT1200.

To grant permissions:

1. Select PeopleTools, Security, Permissions & Roles, Permission Lists.
2. Open permission list *PTPT1200.*
3. In the Pages page, add new menu *CUBE_TEST.*
4. Click the Edit Components link of menu CUBE_TEST, and grant permission to every component.

   The Component Permissions page for Cube Manager appears.

After permission is granted, a new folder called Cube Tester Sample Data appears under the Essbase Cube Builder folder. Items in the Cube Tester Sample Data folder are used for *Accounts,Products,Regions, Sellers,* and *Transactions.* You can add new items to any of these components to create more demo data.

Importing PS_CUBEBUILDER.DAT File Using Data Mover Script PS_CUBEBUILDER.DMS

The data mover script PS_CUBEBUILDER.DMS includes the following items:

- Tree structures.

  Includes two tree structures: CUBT_REGIONSTRUCT and CUBT_PRODUCTS.

- Trees.

  Includes two trees: CUBT_PRODUCTS and CUBT_REGIONS.

  The tree CUBT_PRODUCTS is linked to the product table and makes use of setID controls to show how these controls work in trees.

  The tree CUBT_REGIONS is linked to the region table.

- Data for all the tables that are imported in project CUB_TESTDATA.

The data import file PS_CUBEBUILDER.DAT includes all this set control data that is used for the trees and the sample data:

- SetID

  Includes three setIDs: EUR, SHARE, and USA.

- Record groups

  Includes one record group: CUBETEST.

- Tableset controls

  Includes some tableset rows for set IDs: EUR, MODEL, SHARE, and USA.

Both PS_CUBEBUILDER.DAT and PS_CUBEBUILDER.DMS files are delivered as part of PeopleTools 8.50.

Note. The data mover file (PS_CUBEBUILDER.DMS) contains the *IGNORE_DUPS* option, which imports the data and will not overlay any possible user data that has the same keys. When data mover contains this *IGNORE_DUPS* option, it works only if you log into Data Mover in bootstrap mode.

Granting Query Security

To grant query security:

1. Select PeopleTools, Security, Query Security, Query Access Manager.
2. Open the tree *QUERY_TREE_PT*.
3. Add the following records under the *OLAP - Cube Manager Record* node:
   - *PSCUBTTRANS*
   - *PSCUBTSELLER*
   - *PSCUBTREGION*
   - *PSCUBTPRODUCT*
   - *PSCUBTACCOUNT*
   - *PSCUBTTRANSD_VW*
4. View the queries that were imported from the project.

   Note that:

   - Query CUBT_ACCOUNTS can be used to build a dimension structure.
   - Queries CUBT_TRANSACTIONS and CUBT_ALL_TRANSACTIONS can be used to populate the cube structure.
   - Query CUBT_TRANSDATES can be used to create a time dimension, and it displays all unique transaction dates from the transaction table.

Adding Data to Tables

You can add data to the tables after you apply project CUBE_DEMO_PROJ, grant permissions to all menu CUBE_TEST components, import .DAT file, and grant query security.

The PSCUBTTRANS table contains all the transactional data that is used to populate the cube. The other tables contain definitional data with:

- Sellers—PSCUBTSELLER
- Regions—PSCUBTREGION
- Products—PSCUBTPRODUCT
- Accounts—PSCUBTACCOUNT

All tables are accessible from the new components.

Using Sample Dimensions and Outlines

These sample dimensions are also included in the project CUBE_DEMO_PROJ:

- CUBT_ACCOUNTS
- CUBT_ALL_REGIONS
- CUBT_EUROPEAN_PRODUCTS
- CUBT_TRANSACTION_DATES

The sample outline CUBT_OUTLINE makes use of the preceding dimensions. It also uses query CUBT_ALL_TRANSACTIONS as the query to populate the outline.

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