

# Data Marts and OLAP Guide

05/15/2012 Blackbaud CRM 2.93 Data Marts and OLAP US

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Data Marts and OLAP-2012

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# Data Marts Configuration

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Before you manage your data mart and OLAP information, we recommend you set up configuration options. From the Reporting data mart page, you can access tasks required to configure these options under **Configuration**. To access the Reporting data mart page click **Data marts** in *Administration*, and on the Data Marts page, select a data mart and click **Go to data mart**.

## Select Eligible Smart Fields

In addition to the fields that the Data Mart Deployment Wizard includes in the data mart, you can also add eligible smart fields to the data mart. For smart fields to be eligible for the data mart, they must have a record type of constituent or revenue application and the data type must be Boolean or anything with value groups. After you set up eligible smart fields to perform calculations on the records that are the source of the data mart, you can manually add them to the data mart.

On the Reporting data mart page, click **Select eligible smart fields** under **Configuration**. The OLAP smart field selection screen appears.

To load eligible smart fields, select them in the grid on the left and click the arrow to add them to the grid on the right.

## Select Eligible Attribute Categories

In addition to the fields that the Data Mart Deployment Wizard includes in the data mart, you can also add eligible attribute categories to the data mart. For attribute categories to be eligible for the data mart, they must have a record type of constituent, revenue, educational history, event, registrant, designation, interaction, or modeling and propensity. In addition, the data type for the attribute categories must be code table or yes/no. After you set up eligible attribute categories, you can manually add them to the data mart.

On the Reporting data mart page, click **Select eligible attribute categories** under **Configuration**. The OLAP attribute category selection screen appears.

To load eligible attribute categories, select them in the grid on the left and click the arrow to add them to the grid on the right.

## Deploy Eligible Source Codes

When the Data Mart Deployment Wizard creates the data mart, it copies data from records in the source. You can also add eligible source codes to the data mart. You add source codes to advertisements or promotions to identify the associated lists, offers, packages, and segments. After you add the source codes to any gifts or other responses you receive, you can use them for analysis purposes.

For more information about source codes, see the *Marketing and Communications Guide*.

After you associate source codes with the fields from the data mart's source, you can manually add the source codes to the data mart. On the Reporting data mart page, click **Deploy eligible source codes** under **Configuration**. A confirmation message appears. To load the source codes into the data mart, click **Yes**.

## Edit HTTP Data Source URL

On the Reporting data mart page, you can enter a URL to connect to the OLAP cube over HTTP. This allows your local OLAP client to connect to a remote OLAP server. Under **Configuration**, click **Edit HTTP data source url**. In the **Url** field, enter the address to connect to Analysis Services. Click **Save**. You return to the Reporting data mart page.

With this URL, an OLAP client such as Microsoft *Excel* can access OLAP data over the Internet. This is useful to run a local copy of *Excel* against a remote OLAP server. You can configure the web server to proxy the MDX commands from *Excel* or any other OLAP client, and the OLAP Excel Reports feature will use the URL you supply in the connection string in place of the OLAP server name.

## Edit ETL Queues

If you have business processes that should occur immediately before or after the ETL process, you can create queues for the business process and schedule them to occur each time the ETL process runs. For example, since the ETL process adds data to the data mart, you can run a queue that includes the Smart Field Process after the ETL process to ensure that the smart fields are up to date.

For information about how to set up a queue process, see the *Administration Guide*.

### ► Attach queues to run before or after the ETL process

1. From *Administration*, click **Data marts**. The Data Marts page appears.
2. Select the data mart and click **Go to data mart**. The Reporting data mart page appears.
3. Under **Configuration**, click **Edit ETL queues**.
4. In the **Pre-ETL queue** field, enter the queue to run before the ETL process. To search for a queue, click the binoculars.
5. In the **Post-ETL queue** field, enter the queue to run after the ETL process. To search for a queue, click the binoculars.
6. Click **Save**. You return to the Reporting data mart page.

## Edit Valid Date Range

On the Reporting data mart page, you can specify a valid date range for the OLAP cube. The cube excludes all dates outside this date range from its date dimensions so that only dates within the date range are considered when you use the cube for reporting and analysis.

To specify a date range, click **Edit valid date range** under **Configuration**. The Edit valid date range screen appears.

In the **Start Date** and **End Date** fields, enter a date range for the cube's date dimensions. To search for dates, click the calendar icons. Click **Save**. You return to the Reporting data mart page.

After you set the date range, you must apply it to the cube. First, click **Reset ETL** under **Refresh data** to reset the incremental ETL refresh to prompt a full refresh during the next ETL process. Then click **Start ETL refresh** to manually start the ETL process. For more information about these tasks, see Reset ETL on page 12 and Start ETL Refresh on page 11.





# Data Marts and OLAP

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After you install the program, you can create a standard data mart with the Blackbaud Data Mart Deployment Wizard. The data mart copies data from your source database and places it in a data warehouse to allow you to conduct complex reporting and analysis. For information about the deployment wizard, see the *Installation Guide*.

After you create the data mart, options appear in *Administration* for the Extract, Transform, and Load (ETL) process. The ETL process extracts records from the source database, transforms them for optimal loading into the OLAP cube, and loads them in the data mart. From *Administration*, you can access the Reporting data mart page to monitor ETL activity, schedule business processes to coincide with the ETL process, and manually start an ETL refresh.

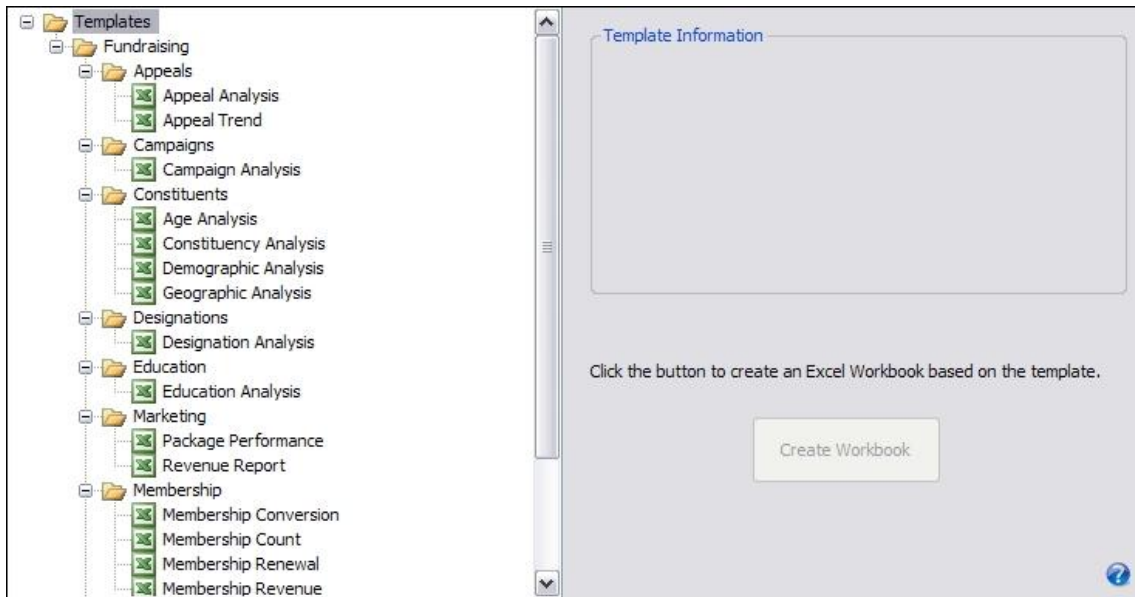
When the deployment wizard creates the standard data mart, it also creates an OLAP cube to conduct complex reporting and analysis on the data in the data mart. The cube increases your ability to manipulate data from the source database, and it allows you to perform advanced reporting. With the OLAP Explorer, you can build pivot tables and charts based on the OLAP cube. The program also includes Microsoft *Excel* report templates so that you can use subsets of the data in the OLAP cube to create reports in *Excel*.

## OLAP Excel Reports

After you create a data mart and its OLAP cube, you can conduct complex reporting and analysis on data from the program. To manipulate subsets of data from the OLAP cube in spreadsheets, you can use the Microsoft *Excel* report templates to create workbooks in *Excel*.

**Note:** You must use *Excel 2007* or *2010* to create a workbook from the available templates.

The workbooks copy a subset of data from the OLAP cube, and you can manipulate the data in the spreadsheets to create complicated reports that take advantage of the cube's multidimensional view of the data. To create *Excel* reports from the OLAP cube, go to *Analysis* and click **OLAP Excel reports**. The Excel Report Templates screen appears.



On this screen, you select a template from the hierarchy. A description appears under **Template Information**. To create a workbook based on the template, click **Create Workbook**. The Save Excel Workbook screen appears. After you save the workbook, you can create spreadsheets in *Excel* and manipulate the subset of data from the OLAP cube that is associated with the template. For information about how to create reports in *Excel*, see the Microsoft *Excel* help file.

**Note:** If you run a local copy of *Excel* against a remote OLAP server, you must connect to the cube over HTTP. To supply the URL for the OLAP Excel Reports feature to use in the connection string, see “Edit HTTP Data Source URL” on page 4.

## Excel Report Templates

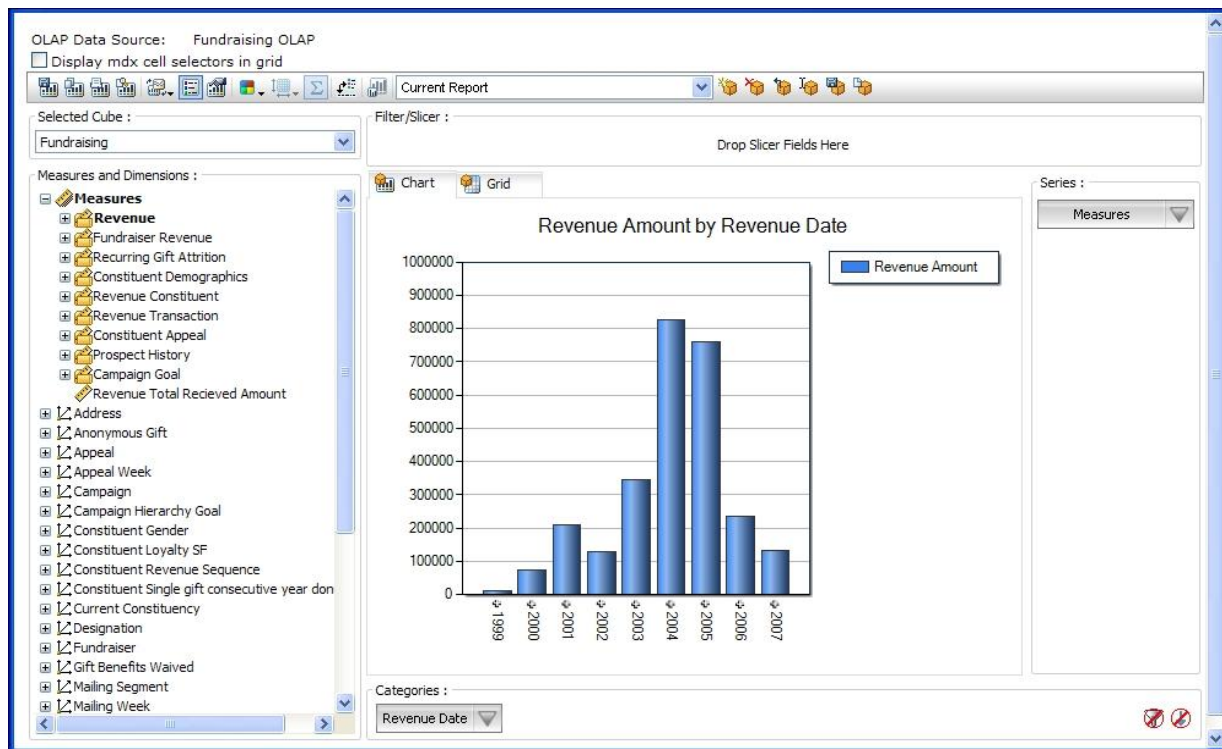
This table lists the report templates you can use to create workbooks in *Excel*.

Screen Item	Description
Age Analysis	Use this template to break down constituent counts, revenue counts, and revenue amounts by the age of constituents.
Appeal Analysis	Use this template to break down constituent counts, revenue counts, and revenue amounts for your appeals.
Appeal Trend	Use this template to chart the amounts that appeals receive each week. You can use the chart to compare appeals.
Campaign Analysis	Use this template break down constituent counts, revenue counts, and revenue amounts for your campaigns.
Constituency Analysis	Use this template to break down constituent counts, revenue counts, and revenue amounts by constituencies. This template creates a chart to plot revenue amounts by constituency.
Demographic Analysis	Use this template to break down constituent counts, revenue counts, and revenue amounts by demographics such as ethnicity, religion, and income.
Designation Analysis	Use this template to break down constituent counts, revenue counts, and revenue amounts for your designations.

Screen Item	Description
Education Analysis	Use this template to break down constituent counts, revenue counts, and revenue amounts by education information such as class year and study area.
Geographic Analysis	Use this template to break down constituent counts, revenue counts, and revenue amounts by geographic information for constituents.
Inbound Channel Analysis	Use this template to break down constituent counts, revenue counts, and revenue amounts by the source, or the inbound channel, of the revenue.
Package Performance	Use this template to break down packages in marketing efforts by quantity mailed, gifts, response rate, revenue, average revenue, revenue per piece, cost per piece, and net revenue per piece.
Pledge Performance	Use this template to break down pledge balances according to fiscal year. You can also break down late pledge payments by fiscal year.
Revenue Report	Use this template to break down marketing efforts by quantity mailed, gifts, response rate, revenue, average revenue, total cost, net revenue, return on investment, and cost per dollar raised.
Recurring Gift Performance	Use this template to break down recurring gifts by fiscal year.
Year over Year Analysis	Use this template to break down constituent counts, revenue counts, revenue amounts, and percent changes from fiscal year to fiscal year. This template creates a chart that plots revenue amount by fiscal year.

## OLAP Explorer

After you create a data mart and its OLAP cube, you can conduct complex reporting and analysis on data from the program. To build pivot tables and charts within the program, you use the OLAP Explorer. The OLAP Explorer allows you to manipulate data in the OLAP cube and take advantage of the cube's multidimensional view to create complicated reports. To create pivot tables and charts, go to *Analysis* and click **OLAP explorer**. The OLAP Explorer appears.



On the OLAP Explorer, you can use the measures and dimensions in the OLAP cube to create complex reports. The cube categorizes data into measures and dimensions to provide a multidimensional view of the data. This allows you to view the data and create reports from a variety of perspectives.

Measures are the numeric values such as constituent count and revenue amount that you track in your reports. Dimensions are variables such as date and location that are similar to the fields in the database. To create a report, you calculate the values of measures at the intersection of dimensions. For example, to create a report that shows how much you raised on a certain day in a certain city, you calculate the revenue amount measure at the intersection of the date and location dimensions. This resulting report shows how much you raised on the designated day in the designated city.

The OLAP Explorer displays your pivot tables and charts on the Chart and Grid tabs. To create the reports, you drag and drop items from **Measures and Dimensions** to **Slicer**, **Series**, and **Categorical**. When the measures and dimensions are in place, you can use the OLAP cube's multidimensional view of the data to drill through the levels of data for top-down analysis.

To create reports in the OLAP Explorer, you manipulate several areas on the screen.

### Display mdx cell selectors in grid

When you select this checkbox, entries on the Grid tab include an **mdx** link. When you click this link, the Cell value MDX screen displays the MDX query statement that populates that cell in the grid.

### Toolbar

You use the toolbar to manage reports in OLAP Explorer, adjust the appearance, and save and print charts and grids. For information about the toolbar buttons, see OLAP Explorer Toolbar on page 10.

### Selected Cube

In this field, select the OLAP cube to use in the report. To create an OLAP cube, you deploy a data mart with the Blackbaud Data Mart Deployment Wizard. For information about the deployment wizard, see the *Installation Guide*. After you select a cube, the measures and dimensions from the cube appear in OLAP Explorer, and you use these items to create your report.

## Measures and Dimensions

The OLAP cube categorizes data into measures and dimensions. Measures are numeric values such as constituent count and revenue amount that you track in reports. Dimensions are variables such as date and location that are similar to the fields in the database. To create a report, you calculate the values of measures at the intersection of dimensions. Under **Measures and Dimensions**, the items appear for the cube you select. To create pivot tables and charts from the data in the cube, you drag and drop measures and dimensions to **Slicer**, **Series**, and **Categorical**. After you select your measures and dimensions, you can use the OLAP cube's multidimensional view of the data to drill through the levels of data for top-down analysis. On the Dimension tab of the Add database roles screen, you can filter the dimensions that appear under **Measures and Dimensions**. For information, see Add Database Roles on page 17.

### Slicer

To filter the data in your chart and grid, drag and drop dimensions to **Slicer** and click the arrow beside the dimension. The Edit Slicer Axis Item screen appears. In the hierarchy, select the data to include in your report and click **OK**. For example, to include only married constituents in a report, drag and drop the **Marital Status** dimension from **Measures and Dimensions** to **Slicer**. On the Edit Slicer Axis Item screen, select "Married" and clear all other items in the hierarchy. The report now only includes data for married constituents.

### Chart and Grid tabs

The Chart and Grid tabs display a chart and pivot table with the data you select in the OLAP Explorer. These reports calculate the measures and dimensions under **Slicer**, **Series**, and **Categories**. When you drag and drop items from **Measures and Dimensions**, the OLAP Explorer updates the chart and grid. To filter the data in the reports, you can manipulate the measures and dimension. To adjust the appearance of the reports, use the OLAP Explorer toolbar. For information about the toolbar buttons, see OLAP Explorer Toolbar on page 10.

### Series

To calculate the numeric value of measures or dimensions in your report, drag and drop them to **Series**. The OLAP Explorer calculates the value of these items against any measures and dimensions under **Categorical**, and the Chart and Grid tabs display the report. The items under **Categorical** serve as an X axis in the chart, and the chart presents value of the items under **Series** when measured against the X axis. For example, to create a report to show how much you raised each year, select the Revenue Amount measure under **Series** and the Revenue Date dimension under **Categorical**. The chart displays the amount you raised for each year in the Revenue Date dimension.

### Categorical

To select the measures or dimensions against which to compare the items under **Series**, drag and drop them to **Categorical**. The report calculates value of items under **Series** when measured against items under **Categorical**. For example, to create a report on how much money you raised in each state, select the Revenue Amount under

**Series** and the Address dimension under **Categorical**. The states in the Address dimension appear along the X axis of the chart, and the report calculates the revenue amount raised for each state.

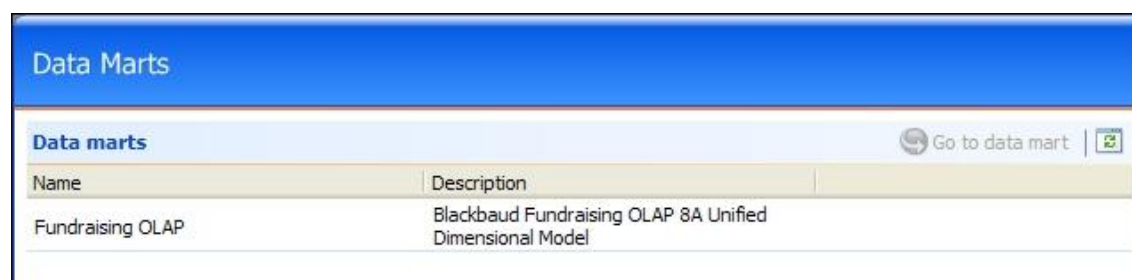
## OLAP Explorer Toolbar

Button	Function	Description
	<b>Save Chart Image</b>	This button opens or saves a .png version of the graphic in the Chart tab.
	<b>Copy Chart/ Copy Grid</b>	This button copies the graphic in the Chart tab or the data on the Grid tab to the clipboard so you can paste it into another program.
	<b>Print Chart/ Print Grid</b>	This button prints a hard copy of the graphic in the Chart tab or the data on the Grid tab.
	<b>Print Preview Chart/Print Preview Grid</b>	This button previews the graphic in the Chart tab or the data on the Grid tab before you print a hard copy.
	<b>Select Chart Type</b>	This button allows you to select the format for the graphic on the Chart tab. The drop-down menu includes line charts, bar charts, and pie charts.
	<b>Toggle Chart Legend</b>	This button hides or displays the legend on the Chart tab.
	<b>Properties</b>	This button allows you to edit the appearance of the graphic on the Chart tab. You can edit the text, color, font, and position of the chart, legend, labels, and X and Y axes.
	<b>Select Color Palette</b>	This button allows you to select a color scheme for the graphic on the Chart tab and the table on the Grid tab.
	<b>Grid Orientation</b>	This button toggles between a horizontal and vertical view of the data on the Grid tab.
	<b>Show Grid Total</b>	This button hides or displays the <b>Total</b> column on the Grid tab.
	<b>Pivots Data</b>	This button pivots the data. On the Chart tab, it moves the items under <b>Series</b> to the X axis and measures the items under <b>Categories</b> . On the Grid tab, it toggles between a horizontal and vertical view of the data.
	<b>Switch to Simple View/Switch to advanced view</b>	This button hides and displays the items that surround the Chart and Grid tabs. You can use the simple view to increase the space where you display your chart or grid.
	<b>Add Report</b>	This button creates a report based on the current report. Use the report field to toggle between reports.
	<b>Remove Report</b>	This button deletes the current report from OLAP Explorer. If the report was previously saved in a report set, it remains in the report set.
	<b>Revert to Original Report</b>	This button undoes the changes to a report since the last save. This allows you to discard changes to measures and dimensions and revert to the last saved version. It does not affect properties you apply to report's appearance.
	<b>Rename Report</b>	This button allows you to change a report name. By default, OLAP Explorer names reports "Report" plus the next numeral in sequence, starting with "Report 1."
	<b>Save Reports</b>	This button creates a report set that stores all active reports in an XML file.
	<b>Load Reports</b>	This button opens a report set.

## Manage Data Marts

From *Administration*, you can access the Data Marts page to manage the data mart. From the Data Marts page, you open the Reporting data mart page to monitor ETL activity, schedule business processes to coincide with the ETL process, manually start an ETL refresh, or refresh the OLAP cube. To access this page, go to *Administration* and click **Data marts**. The Data Mart page appears.

**Note:** Data mart and OLAP options do not appear until you create the standard data mart. For information about how to deploy the data mart, see the *Installation Guide*.



Data Marts	
Data marts	
Name	Description
Fundraising OLAP	Blackbaud Fundraising OLAP 8A Unified Dimensional Model

On the Data Marts page, the grid displays any data mart that is available as a record source in the program. You can use the data mart and its OLAP cube to conduct complex reporting and analysis on your data.

To monitor the ETL process and configure settings for the data mart, select it and click **Go to data mart**. The Reporting data mart page appears.

## Reporting Data Mart Page

The Extract, Transform, and Load (ETL) process updates the data mart with new records from the source database. On the Reporting data mart page, you can monitor ETL activity, manually start an ETL refresh, reset the ETL process for a full refresh, and schedule queues to run before or after the ETL process. In addition, you can access KPI information about the data mart and the ETL process.

You can also deploy eligible smart fields to the OLAP cube and refresh the data in the cube after the ETL process updates the data mart. On the OLAP database roles tab, you can configure database roles to control access to the OLAP cube.

To keep the data mart up to date, we recommend that you schedule the ETL process to occur at regular intervals. You can create a queue process for the Data Mart Start ETL Refresh Job Business Process and schedule the queue process to run the ETL process at regular intervals.

For information about how to set up a queue process, see the *Administration Guide*.

For information about configuration options, see Data Marts Configuration on page 1.

## Start ETL Refresh

On the Reporting data mart page, you can manually start the ETL process independent of any job schedules. The ETL process extracts any changes or new records from the database, transforms them to meet your requirements, and loads them in the data mart.

The ETL process also updates the OLAP cube with the most recent data from the data mart. When you run the ETL process, it updates the data mart and then loads the data into the OLAP cube.

Under **Refresh data**, click **Start ETL refresh**. The ETL refresh status page appears, and the process updates the data mart with data that was added or modified in the source database since the last ETL refresh.

For more information about the ETL refresh, see Refresh ETL Process on page 13.

## Reset ETL

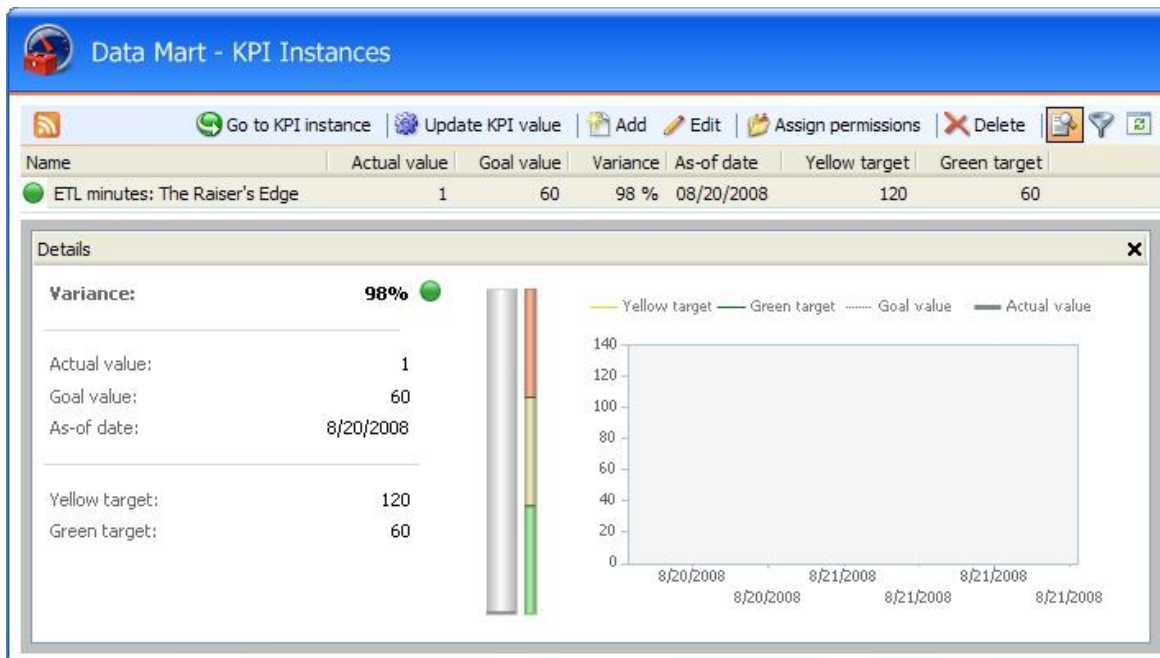
On the Reporting data mart page, you can reset the incremental ETL refresh to prompt a full refresh during the next ETL process. Under **Refresh data**, click **Reset ETL**. On the confirmation message that appears, click **Yes**.

When you reset the incremental ETL refresh, the existing data in the data mart is deleted immediately. And during the next ETL process, the ETL refresh includes the entire source database, not just the data that was added or modified since the previous ETL refresh. This task is useful to remove dated information from the data mart.

The **Reset ETL** task does not effect the OLAP cube.

## Manage KPIs

On the Reporting data mart page, you can manage the Key Performance Indicators for the ETL process. Under **More information**, click **Manage KPIs**. The KPI Instances page appears.



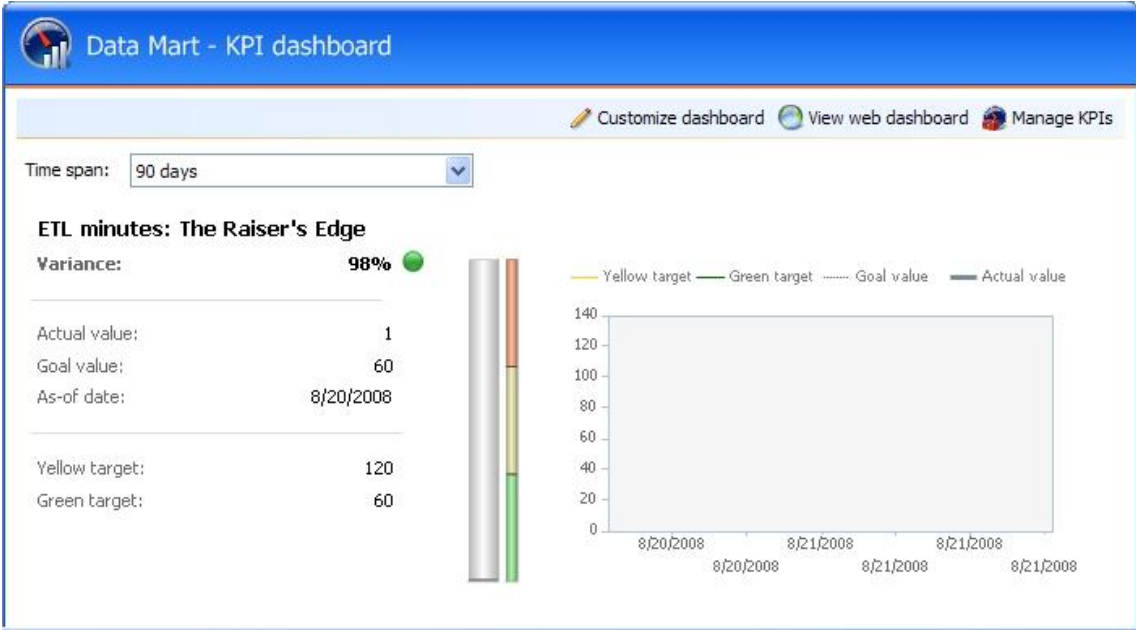
On this page, you can manage KPIs for the ETL process. You use KPIs to track your organization's strategic performance, and the KPI instance for the ETL process defines what you want to accomplish.

For information about KPIs, see the *Reports and KPIs Guide*.

## Edit KPI Dashboard

On the Reporting data mart page, you can view the KPI dashboard for the ETL process. Under **More information**, click **KPI dashboard**. The KPI dashboard page appears.

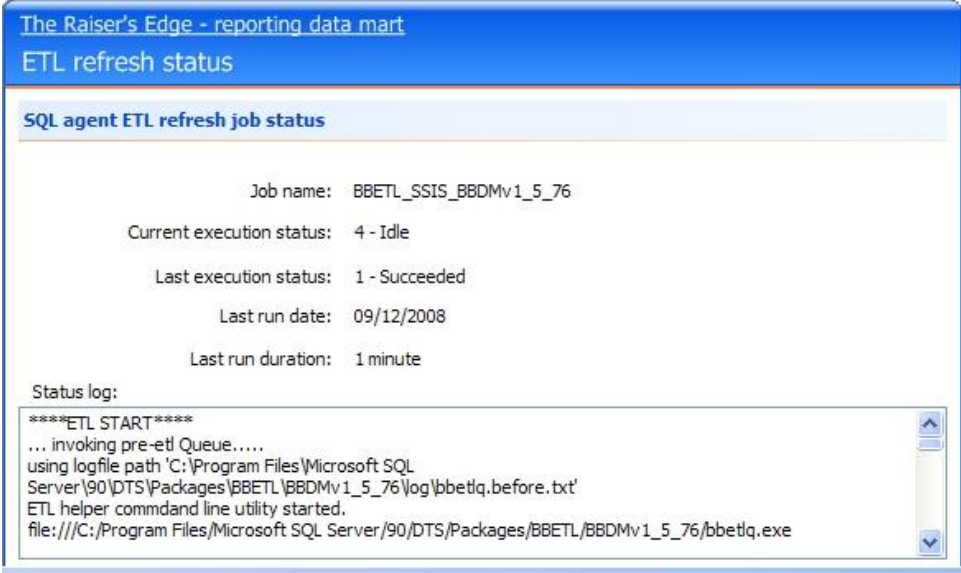




On this page, you can view Key Performance Indicator data for the ETL process. You use KPIs to track your organization’s strategic performance, and the KPI dashboard displays your progress toward the goals. For information about the KPI dashboard, see the *Reports and KPIs Guide*.

## Refresh ETL Process

After you click **Start ETL refresh** Under **Refresh data** on the Reporting data mart page, the ETL refresh status page appears. The **Start ETL refresh** task manually starts the ETL process independent of any job schedules and updates the data mart with data that was added or modified in the source database since the previous ETL refresh. On the ETL refresh status page, you can view information about the ETL process as it runs.



The page displays the job name, current ETL status, whether the process was completed successfully, the date, and how long the process has run. Under **Status log**, a log appears for the ETL process. You can use this log to check the status and to troubleshoot if a problem occurs during the process.

## ETL History Tab

On the ETL history tab, you can monitor ETL activity for the data mart.

ETL history

Name: Fundraising OLAP

Description: Blackbaud Fundraising OLAP 8A Unified Dimensional Model

ETL server: CHS-JLY-PD830\SQL2008

ETL database: BBECv1\_7\_RPT\_BBFR8A

Pre-ETL queue:

Post-ETL queue:

Run-as user: BBNT\JohnLy

**SSIS ETL history**

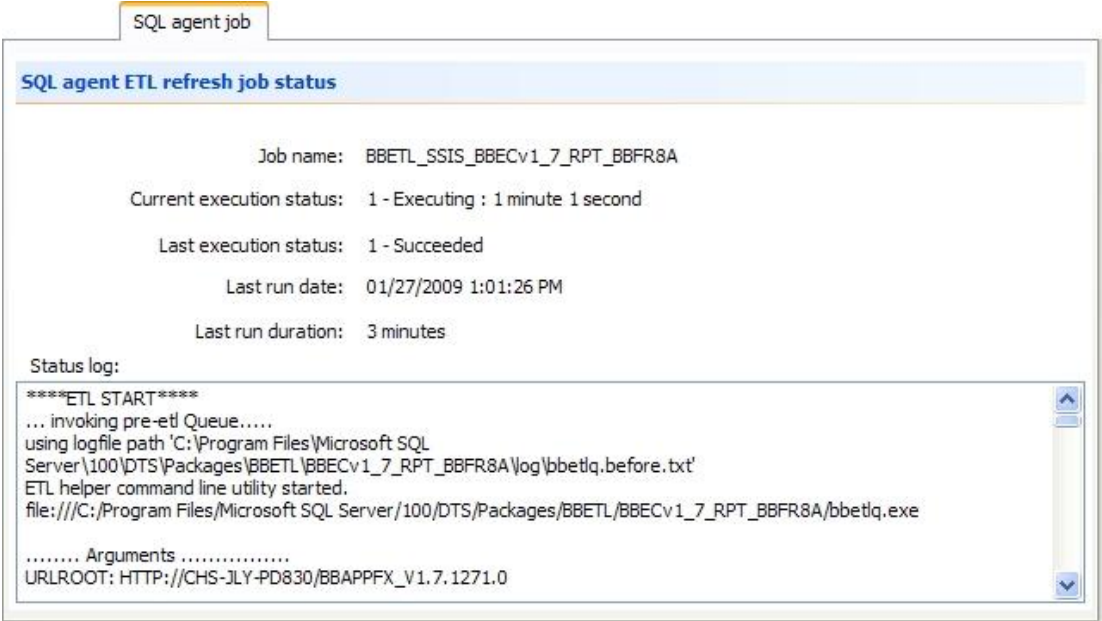
Started	Finished	Completed	Total minutes	ETL control ID	Data window open
01/27/2009 1:01:39 PM	01/27/...	✓	3	55	01/20/2009 1:23:57 PM
01/20/2009 1:23:57 PM	01/20/...	✓	3	1	07/04/1776 12:00:00 AM

This tab displays the name and description of the data mart, the *SQL Server* instance, the application database, any queues you schedule to run before or after the ETL process, and the Microsoft Windows user account used to create the data mart.

The **SSIS ETL history** grid includes each instance of the ETL process. The grid displays when each process occurred, whether it completed successfully, how long it lasted, the ETL Control ID, when the data window was open, and details about the *SQL Server Integration Services* used during the ETL process. To sort entries in the grid according to package name and type, click **Filter**.

## SQL Agent Job Tab

On the SQL agent job tab, you can view information about the most recent instance of the ETL process.

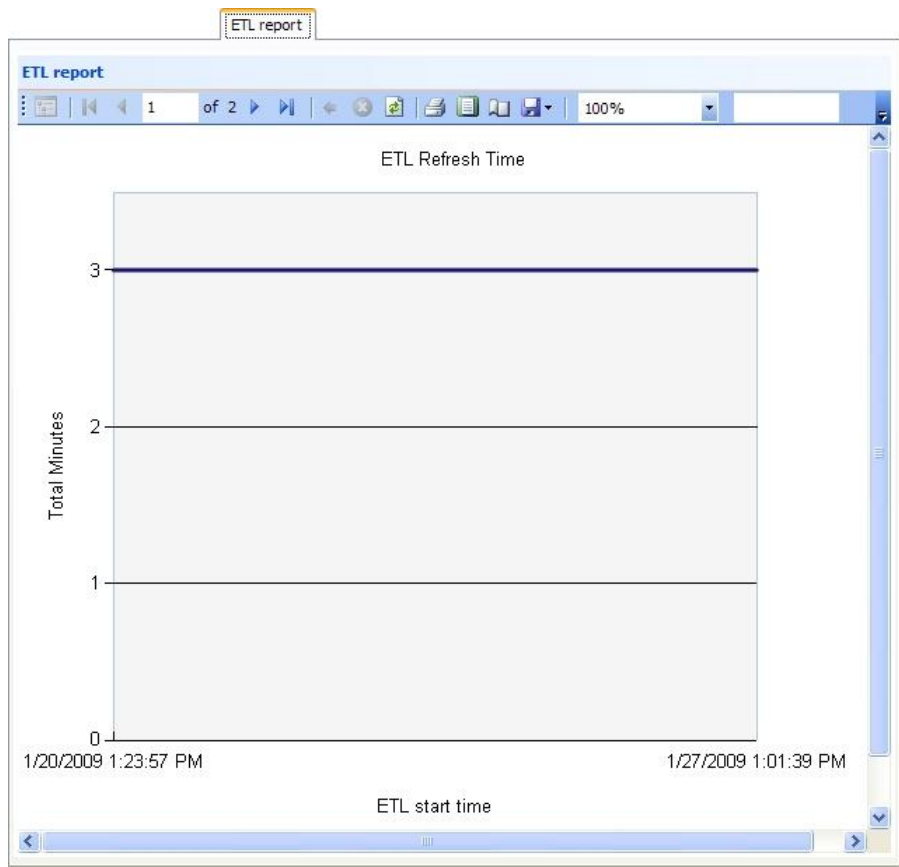


This tab displays the job name, the current ETL status, whether the most recent instance of the ETL process was completed successfully, when the process was run, and how long it lasted.

Under **Status log**, a log appears for the most recent instance of the ETL process. You can use this log to check the status or to troubleshoot if a problem occurs during the process.

## ETL Report Tab

On the ETL report tab, you can view a report on the ETL activity.



This tab tracks the instances of the ETL process and displays how long each instance lasts. You can view this information in two formats. A graph chart provides a visual representation of how long each ETL processes lasts, while a standard report lists each instance in a spreadsheet and includes the ETL Control ID and the refresh type. You can use the Report toolbar to print or export the report.

For information about the Report toolbar, see the *General Features Guide*.

## Job Schedules Tab

On the Job schedules tab, you can view information about the job schedules you create to run the ETL process at regular intervals. However, this tab only displays job schedules you create through the SQL Server Configuration Manager. It does not include job schedules for queue processes that you create in *Administration*.

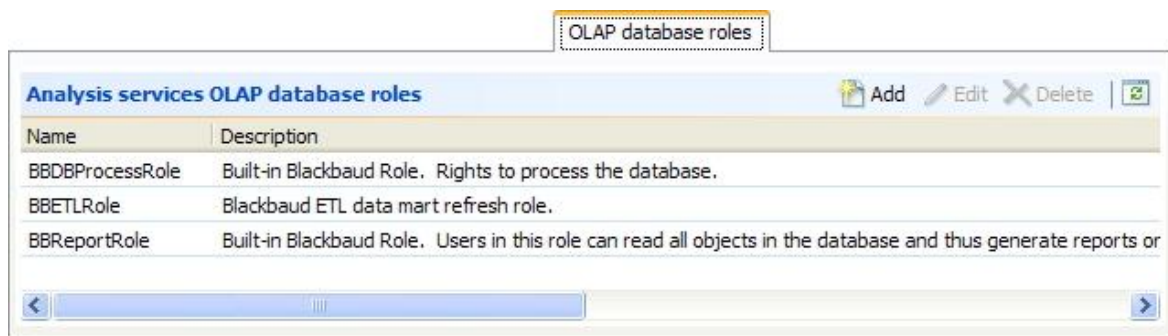
The screenshot shows a window titled 'SQL agent job schedules' with a toolbar at the top. Below the toolbar is a table with the following columns: Schedule name, Schedule enabled, Frequency, Start date, Start time, End date, End time, Date added, and Date. The table is currently empty.

This tab displays the name of the job schedule, whether it has been enabled, how often it occurs, when it occurs, when it was added, and when it was last changed.

**Note:** We recommend that you create a job schedule in the program to keep your data mart up to date. To do this, create a queue process for the Data Mart Start ETL Refresh Job Business Process. After you create the queue process, create a job schedule on the queue process page to run the ETL process at regular intervals. For information about how to create the queue process, see the *Administration Guide*.

## OLAP Database Roles Tab

On the OLAP database roles tab, you can create database roles to control access to the information in the data mart's OLAP cube. With these database roles, you can set permissions to limit the data that users can view and manipulate in the cube. This tab includes three default database roles appear, and you can create roles as necessary.



When you create a database role, you can assign users to that role and set a variety of permissions for them. You can assign permissions for the database and for the individual cells in the OLAP cube, and you can assign rights to drill through the cube and to filter the data in the cube's dimensions. The permissions you set for your database roles allow you to enforce security on the OLAP cube and control how users access the information in the database. After you add users to a database role, they can access the cube with the restrictions placed on their database role to conduct advanced reporting on the records in the data mart.

**Note:** For more information about OLAP role security, see the Microsoft SQL Server 2008 help documentation for *Analysis Services*. You can also find information online about the Analysis Services database roles at [msdn.microsoft.com/en-us/library](http://msdn.microsoft.com/en-us/library).

## Add Database Roles

To create reports on the data in the OLAP cube, users must belong to a database role. The database role that users belong to determines the records they can access in the cube and how they can manipulate the cube. On the OLAP database roles tab, you create and edit database roles and select the users to include.

### ► Create an OLAP database role

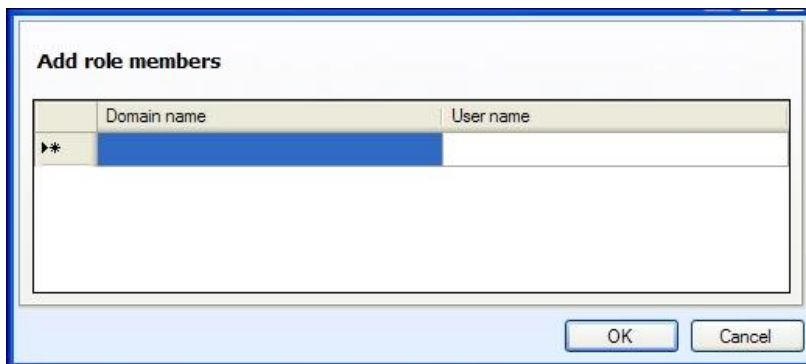
1. From *Administration*, click **Data marts**. The Manage Data Marts page appears.
2. Select the data mart and click **Go to data mart**. The Reporting data mart page appears.
3. On the OLAP database roles tab, click **Add**. The Add database role screen appears. On this screen, you enter permissions for members of the database role to access the OLAP cube. For a detailed explanation of the options on this screen, see Add Database Role Screen on page 22.

The screenshot shows the 'Add database role' dialog box with the 'General' tab selected. The dialog has a title bar and a header area with the title 'Add database role'. Below the header are five tabs: 'General', 'Membership', 'Cubes', 'Cell Data', and 'Dimension Data'. The 'General' tab is active. The main area contains a 'Role name:' label followed by a text input field, and a 'Role description:' label followed by a larger text area. Below these fields is the text 'Set the database permissions for this role:' followed by three checkboxes: 'Full control (Administrator)', 'Process database', and 'Read definition'. At the bottom right of the dialog are 'Save' and 'Cancel' buttons.

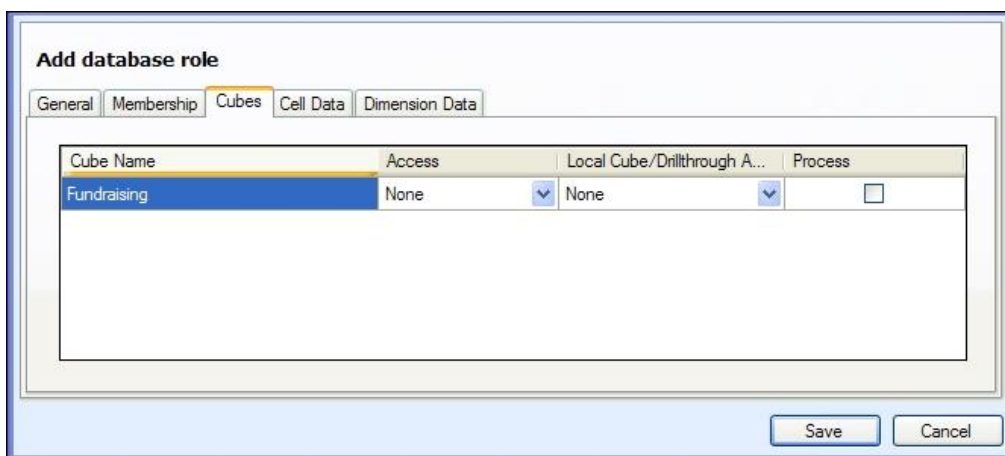
4. On the General tab, enter a name and description for the database role, and select the database permissions to assign to the role.
  - To grant full access and write permissions to change the objects in the data mart, select **Full control (Administrator)**.
  - To grant access to process database objects and to view metadata about the objects, select **Process database**. Users with this permission level cannot change dimensions and cubes or edit the data in them.
  - To allow users to view metadata about database objects but to deny access to the data in the cube, select **Read definition**.

The screenshot shows the 'Add database role' dialog box with the 'Membership' tab selected. The dialog has the same title and header as the previous screenshot. The 'Membership' tab is active. The main area contains the text 'The users and groups member of this role will have privileges in all the Analysis Services objects associated with this role.' followed by a large empty list box. At the bottom right of the list box are 'Add...' and 'Remove' buttons. At the bottom right of the dialog are 'Save' and 'Cancel' buttons.

5. On the Membership tab, click **Add** to select users and groups for the database role. The Add role members screen appears.



6. Enter the domain and user name for each member of the OLAP database role.
7. Click **OK**. You return to the Add database role screen.



8. On the Cubes tab, assign permissions to access the OLAP cube.
  - a. In the **Access** column, select whether to assign read or read/write access to the OLAP cube. By default, users cannot access any cube in the database.
  - b. In the **Local Cube/Drillthrough Access** column, select whether to allow users to create local cubes or to drill through the cube to more detailed data. Select "Drillthrough" to allow users to access detailed data within the cube but not to create local cubes. Select "Drillthrough and Local Cube" to allow users to do both. To create subsets of the OLAP cube with the OLAP Excel Reports feature, users must be able to create local cubes. Local cubes allow users to view data from the OLAP cube even when they are not connected to the server with the data.
  - c. In the **Process** column, select whether to allow users to manipulate data in the cube.

**Add database role**

General Membership Cubes **Cell Data** Dimension Data

Cube:

Enable read permissions  
Allow reading of cube content:

Enable read-contingent permissions  
Allow reading of cell content contingent on cell security:

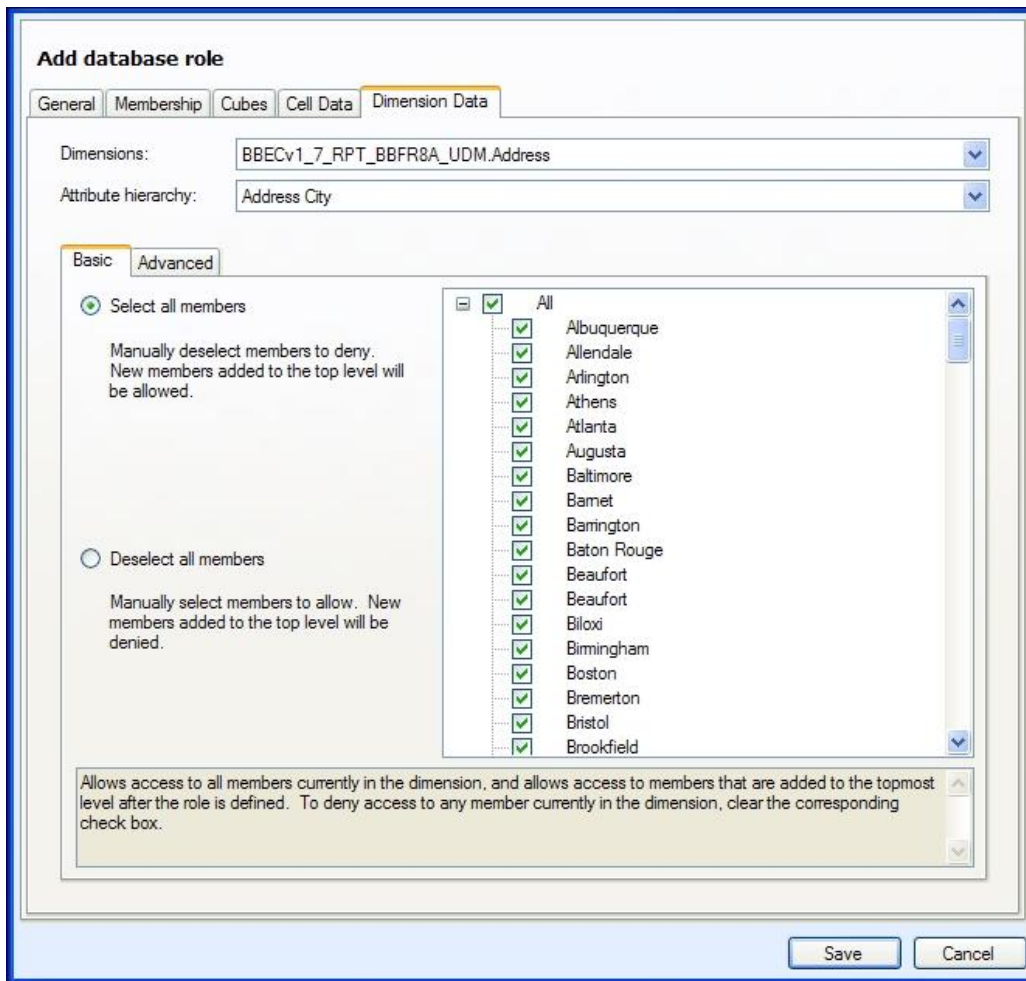
Enable read/write permissions  
Allow reading and writing of cube content:

Save Cancel

9. On the Cell Data tab, assign permissions to individual cells in the OLAP cube and enter MDX expressions to enforce cell-level security.
  - a. In the **Cube** field, select the OLAP cube.
  - b. Select the permissions to grant users for the cube.
    - To grant read-only access to the cells in the cube, select **Enable read permissions**. With read-only access, users can view the cells in the MDX expression.
    - To grant read-contingent access to the sells in the cube, select **Enable read-contingent permissions**. With read-contingent access, users can view the cells in the MDX expression only if the database role has read permission on the cells they were derived from.
    - To grant read/write access to the cells in the cube, select **Enable read/write permissions**. Members of the database role can view and update the cells in the MDX expression, but they also must have read/write permissions for the entire cube.
  - a. In the box under each permission you select, enter an MDX expression to select the cells that the permissions apply to. For each cell, the MDX expression is calculated before the program displays the cell value. If the expression returns a value of true, the program displays the cell value. If it returns a value of false, the program does not display the cell value.



**Warning:** To grant permissions on a subset of cube cells, you must include an MDX expression. If you assign cell-level permissions but do not include an MDX expression to specify the cells, the database role does not have permissions on any cells in the cube.



10. On the Dimension Data tab, filter the cube dimensions that users can access. Dimensions are variables such as date and location that are similar to fields in the database. To create reports with the OLAP cube, you calculate measures such as constituent count and revenue at the intersection of dimensions. On the Dimension Data tab, you can exclude data from dimension attributes or exclude entire attributes.
  - a. In the **Dimensions** field, select a dimension, and in the **Attribute hierarchy** field, select one of its attributes.
  - b. On the Basic tab, select the data to include in the dimension attribute. By default, the program includes all data in the attribute. To exclude data from the attribute, clear the checkboxes in the hierarchy. To exclude the entire attribute, select **Deselect all members**.
  - c. The Advanced tab displays data about the data you filter in a dimension attribute. For **Select all members** on the Basic tab, any data you exclude appears under **Denied member set**. For **Deselect all members**, any data you include appears under **Allowed member set**. Any data that you cannot exclude from the attribute appears under **Default member**.
11. Click **Save**. You return to the OLAP database roles tab. The new database role appears in the grid.

## Add Database Role Screen

This table explains items on the screen that may require additional information.

Screen Item	Description
<b>Set the database permissions for this role</b>	On the General tab, you can assign full control of the database to members of the database role, or you can place limits on their access. To grant full access and write permissions to change the objects in the data mart, select <b>Full control (Administrator)</b> . To grant access to process database objects and to view metadata about the objects, select <b>Process database</b> . Users with this permission level cannot change dimensions and cubes or edit the data in them. To allow users to view metadata about database objects but to deny access to the data in the cube, select <b>Read definition</b> .
Membership tab	Enter the domain and user name for each member of the OLAP database role.
<b>Cube Name</b>	Select a cube to grant access rights.
<b>Access</b>	Select whether to assign read access or read/write access to the OLAP cube. By default, users cannot access any cube in the database.
<b>Local Cube/Drillthrough Access</b>	Select whether to allow users to create local cubes or to drill through the cube to more detailed data. Select "Drillthrough" to allow users to access detailed data within the cube but not to create local cubes. Select "Drillthrough and Local Cube" to allow users to do both. To create subsets of the OLAP cube with the OLAP Excel Reports feature, users must be able to create local cubes. These local cubes allow users to view data from the OLAP cube even when they are not connected to the server with the data.
<b>Process</b>	Select whether to allow users to manipulate the data in the cube.
Cell Data tab	Assign permissions to individual cells in the OLAP cube and enter MDX expressions to enforce cell-level security. To grant read-only access to the cells in the cube, select <b>Enable read permissions</b> . With read-only access, users can view the cells in the MDX expression. To grant read-contingent access to the sells in the cube, select <b>Enable read-contingent permissions</b> . With read-contingent access, users can view the cells in the MDX expression only if the database role has read permission on the cells they were derived from. To grant read/write access to the cells in the cube, select <b>Enable read/write permissions</b> . Members of the database role can view and update the cells in the MDX expression, but they also must have read/write permissions for the entire cube. In the box under each permission you select, enter an MDX expression to select the cells that the permissions apply to. For each cell, the MDX expression is calculated before the program displays the cell value. If the expression returns a value of true, the program displays the cell value. If it returns a value of false, the program does not display the cell value. <b>Warning:</b> To grant permissions on a subset of cube cells, you must include an MDX expression. If you assign cell-level permissions but do not include an MDX expression to specify the cells, the database role does not have permissions on any cells in the cube.
Dimensions tab	Filter the data that is available to members of the database role through the OLAP cube's dimensions. In the <b>Dimensions</b> field, select a dimension, and in the <b>Attribute hierarchy</b> field, select one of its attributes. On the Basic tab, select the data to include in the dimension attribute. By default, the program includes all data in the attribute. To exclude data from the attribute, clear the checkboxes in the hierarchy. To exclude the entire attribute, select <b>Deselect all members</b> . The Advanced tab displays data about the data you filter in a dimension attribute. For <b>Select all members</b> on the Basic tab, any data you exclude

Screen Item	Description
	<p>appears under <b>Denied member set</b>. For <b>Deselect all members</b>, any data you include appears under <b>Allowed member set</b>. Any data that you cannot exclude from the attribute appears under <b>Default member</b>.</p>

## Edit Database Roles

After you create database roles to process the OLAP cube and add the users to the roles, you can edit the database roles as necessary.

### ► Edit an OLAP database role

1. On the OLAP database roles tab of the Reporting data mart page, select a role under **Analysis services OLAP database roles**.
2. Click **Edit**. The Edit database role screen appears.
3. Make changes as necessary. The items on this screen are the same as on the Add database role screen. For a detailed explanation of the options, see Add Database Role Screen on page 22.
4. Click **Save**. You return to the OLAP database roles tab.

## Delete Database Roles

After you create a database role to process the OLAP cube, you can delete it as necessary. On the Reporting data mart page, select the role on the OLAP database roles tab and click **Delete**. On the confirmation message that appears, click **Yes**. You return to the OLAP database roles tab, and the role no longer appears in the grid.



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