SUN SEEBEYOND

# eBAM™ STUDIO USER'S GUIDE

**Release 5.1.2**

Sun microsystems

Part Number: 819-6849-11

Version 20061005191157

# Contents

# List of Figures

# List of Tables

Chapter 1

# Introduction

This chapter provides a brief overview of Sun SeeBeyond eBAM™ Studio (eBAM) and general information about this guide.

**What's in This Chapter**



## 1.1 About eBAM Studio

Business Activity Monitoring (BAM) involves the collection, aggregation, and presentation of business activity data according to specified Key Performance Indicators (KPIs). KPIs provide a context for business processes by turning raw data into useful information, allowing the business analyst to focus on monitoring and analyzing measurable operations and processes across the enterprise.

eBAM Studio provides tools for generating custom cross-application graphical dashboards for defining and monitoring KPIs that summarize the aggregated business data collected through the eInsight™ Business Process Manager (eInsight) or eGate™ Integrator (eGate) application layers. Data can be collected over time and transformed into meaningful, rich visual presentations.

eBAM renders real-time and historical data in familiar visual formats, such as pie and bar charts, for display in graphical dashboards. These recognizable, easy-to-read contexts enable you to quickly translate information into action—for example, if you are a business analyst, a custom dashboard of performance data can help you to identify business trends in real time.

eBAM allows you to transform collected data into a visual context for accessibility over the web. By leveraging the web, key business information can be made accessible in a visual context across the enterprise to provide visibility, reporting, and analysis.

# 1.2 What's New in This Release

Beginning with the 5.1.0 release and continuing through the 5.1.1 release eBAM Studio has recieved a number of new features and enhancements. Stable after the 5.1.1 release, the 5.1.2 release includes no new features, and the only enhancements to the 5.1.2 product are documentation-based.

## 1.2.1 eBAM Version 5.1.2 Enhancements

There are no architectual, run time, or GUI enhancements with the 5.1.2 release of eBAM Studio. However, the documentation (*eBAM™ Studio User's Guide* and online HTML Help) has been expanded and improved.

### Documentation Enhancements

Improvements to the documentation include:

- Online HTML Help usability has been improved making the Help easier to use and navigate.
- User's Guide has been fine-tuned, and includes additional information on:
  - Default flatfile database
  - Oracle database
  - Web services **add**, **upsert**, and **delete**
  - Alerts

## 1.2.2 eBAM Version 5.1.1 Enhancements

The 5.1.1 release of eBAM Studio included an architectural and run time enhancement. There were no new GUI or documentation enhancedments.

### Architectural and Runtime Enhancements

New features related to architecture and run time include:

- As of Release 5.1.1, eBAM now supports BEA WebLogic Server 9.1.

## 1.2.3 eBAM Version 5.1.0 Enhancements

The 5.1.0 release of eBAM Studio included architectural, run time, and GUI enhancedments. It also included online HTML Help.

### Architectural and Runtime Enhancements

New features related to architecture and run time include:

- eBAM now supports Oracle 9*i* version 9.2 and Oracle 10*g* (in addition to the prepackaged data storage functionality): Each eBAM application instance on a Connectivity Map has an invoked service named **oracle** that allows you to connect it to an Oracle eWay.

  For information on the Oracle eWay, see the *Sun SeeBeyond eWay Adapter for Oracle™ User's Guide*.

- eBAM now supports Sun Java System Application Server (AS) 8.1 EE.
- In conjunction with AS 8.1, Sun Java System Portal Server can be used to view eBAM charts, either in iFrames (using Portal Server 6 or Portal Server 7) or in JSR 168 portlets (using Portal Server 7 only).

  For more information, see the corresponding chapter in the *Sun SeeBeyond eBAM™ Studio User's Guide* and the Sun documentation for Portal Server.

- eBAM now fully supports data persistence via the eInsight runtime recoverability database when the eInsight Engine is properly configured. (This requires Oracle, Sybase, SQL Server, or DB2.)

  For information on viewing/modifying database scripts and configuring the eInsight Engine, see the *Sun SeeBeyond eInsight™ Business Process Manager User's Guide*.

## General and GUI Enhancements

New features related to the GUI include:

- Workflow and usability improvements make the process of creating and configuring queries, charts, and alerts smoother and more intuitive.
- You can now edit data definitions after initial creation; in other words, you can now rename data definitions, change their data retention properties, add or delete columns to them, and modify column names or types.
- You can now use two or more data definitions in a single eBAM application.
- You can use a new chart type—stacked traffic-lights—for queries that define categories and series.
- You can add a navigation link to any chart, allowing you to navigate from one chart to another when browsing them on the web.
- eBAM provides a new **delete** web service (for data definitions without data retention), and the **execute** web service (for queries) can now be dragged into any eInsight business process or eVision page flow.
- Version Control is fully supported for eBAM applications (at the application level, but not for individual components within an application).
- Copy-and-paste of eBAM applications (but not components) is fully supported.
- Command-line CodeGen is fully supported.

### Documentation Enhancements

New features related to documentation include:

- New online HTML Help.

## 1.3 About This Document

The section provides a chapter overview, purpose and scope of the user's guide, intended audience, the writing conventions used in this document, and a screenshot disclaimer.

### 1.3.1 What's in This Document

This document is organized topically as follows:

- **Chapter 1 "Introduction" on page 12** describes the purpose of this User's Guide, including writing conventions and a list of related documents.
- **Chapter 2 "Overview of eBAM Studio" on page 18** provides an overview of the general structure, architecture, and operation of eBAM Studio and its place within the Sun Java Composite Application Platform Suite.
- **Chapter 3 "Installing eBAM Studio" on page 22** explains how to install eBAM Studio.
- **Chapter 4 "Using eBAM Studio" on page 29** describes generally how to exercise the GUI and explains setting up eBAM data definitions and using the **add**, **upsert**, and **delete** web services.
- **Chapter 5 "Using eBAM Queries" on page 53** explains setting up eBAM queries and using the **execute** web service.
- **Chapter 6 "Using eBAM Alerts" on page 63** explains setting up eBAM alerts and using the **notify** web service.
- **Chapter 7 "Using eBAM Charts" on page 68** explains setting up eBAM charts.
- **Chapter 8 "Sample and Tutorial" on page 70** provides both a quick-start guide to getting a sample eBAM application up and running, and also an extensive hands-on tutorial that guides you through the process of creating and configuring all the components used in the sample.
- **Chapter 9 "Using eBAM Charts in Portals" on page 117** provides background and instructions for displaying eBAM web applications using Sun Java System Portal Server.
- **Appendix A "Chart Types" on page 154** lists the types of charts that eBAM provides along with property information.
- **Appendix B "Persistence and Monitoring" on page 160** explains how to use the eInsight engine to collect and persist data from your business processes.

- **Appendix C "SQL Reserved Words" on page 169** lists reserved SQL terms that must not be used as field names in eBAM applications.

## 1.3.2 Scope

This User's Guide provides general information about the features and operation of eBAM Studio. For information on any other product in the suite, see the product's user's guide. For information on system management, see the *Sun SeeBeyond eGate Integrator System Administration Guide*.

## 1.3.3 Intended Audience

This User's Guide is intended for experienced computer users who are involved in developing and maintaining composite applications using eBAM Studio. Primarily, these are individuals who will be using Enterprise Designer to build projects—often in conjunction with other modules in the Sun Java Composite Application Platform Suite. This guide also provides a basic overview of eBAM Studio for those attempting to gain a general understanding of how the product works.

This guide assumes that the reader is an experienced computer user, familiar with Windows-style GUI operations, and also has an in-depth understanding of each operating system on which eBAM Studio will be installed.

## 1.3.4 Text Conventions

The following conventions are observed throughout this document.

**Table 1** Text Conventions

| Text Convention | Used For | Examples |
|---|---|---|
| **Bold** | Names of buttons, files, icons, parameters, variables, methods, menus, and objects | ▪ Click **OK**.<br>▪ On the **File** menu, click **Exit**.<br>▪ Select the **eGate.sar** file. |
| `Monospaced` | Command line arguments, code samples; variables are shown in **bold italic** | `java -jar` **filename**`.jar` |
| **Blue bold** | Hypertext links within document | See **Text Conventions** on page 16 |
| Blue underlined | Hypertext links for Web addresses (URLs) or email addresses | http://www.sun.com |

## 1.3.5 Screenshots

Depending on what products you have installed, and how they are configured, the screenshots in this document may differ from what you see on your system.

## 1.4 Related Documents

The following documents provide additional information about eBAM Studio as explained in this guide:

- *Java Composite Application Platform Suite Installation Guide*
- *Sun SeeBeyond eGate Integrator System Administration Guide*
- *Sun SeeBeyond eInsight Business Process Manager User's Guide*

For information on a specific add-on product, such as the eWay Intelligent Adapter for Oracle, see the User's Guide for that product. A complete list of Sun documentation is included in the *Java Composite Application Platform Suite Primer*.

The documentation for the Sun Java Composite Application Platform Suite is distributed as a collection of online documents, which can be accessed through the Enterprise Manager (see the *Java Composite Application Platform Suite Installation Guide*). These documents are in Adobe Acrobat format, which requires that Acrobat Reader be installed on your computer. Acrobat Reader can be from Adobe Systems as a free download from the following URL:

http://www.adobe.com

## 1.5 Sun Microsystems, Inc. Web Site

The Sun Microsystems web site is your best source for up-to-the-minute product news and technical support information. The site's URL is:

http://www.sun.com

## 1.6 Documentation Feedback

We appreciate your feedback. Please send any comments or suggestions regarding this document to:

CAPS_docsfeedback@sun.com

Chapter 2

# Overview of eBAM Studio

eBAM Studio allows you to create business activity monitoring applications that intercept the flow of data through other components of Java Composite Application Platform Suite (Java CAPS) to produce visual presentations of data analysis based on KPIs and alerts.

This chapter provides overviews of eBAM's architecture and overall approach to business activity monitoring.

**What's in This Chapter**



## 2.1 eBAM and Business Activity Monitoring

The eBAM web interface allows business analysts to transform data that has been collected over time into meaningful, rich visual presentations by providing different views of performance data that enable the identification of time-critical business trends. Leveraging Java CAPS and the web, eBAM provides visibility to key business information, recasts it in a graphical format, and makes it available across the enterprise.

### eBAM Application Requirements

An eBAM application requires access to runtime resources, from which it gathers raw data and processes it (via user-configured aggregation and presentation) to render it into a meaningful format. An eBAM application requires the following:

- Access to runtime data from suite processes.
- Data definitions (the facts that form the basis for the calculation of a KPI value).
- The dashboard (visual) representation of the KPI.
- The events that are triggered when the value of the KPI crosses a preset threshold.
- Graphical dashboard presentations—visual presentation of data using bar charts, pie charts, and meters (dial indicators).

- User-defined timeframes, such as frequency and starting/ending dates and times.

eBAM ties into raw data via JMS, eGate, and web services to perform real-time analysis on data received from external systems, business processes, or composite applications.

## 2.2 Summary of eBAM Components

eBAM takes a simple approach to business activity monitoring. Each eBAM application provides a mechanism for sampling the data traffic and storing results in a way that allows standing queries to update and communicate their findings.

The components of an eBAM application consist of:

- **Data definitions**

  Data definitions provide the raw ingredients used by all the other components in an eBAM application.

  A data definition specifies the following:

  - An identifying label and a datatype for each of the data elements collected.
  - The length of time to retain data before flagging it for removal and the frequency at which expired data is removed when data retention is specified.

- **Queries**

  Queries provide the recipes that combine and manipulate the data elements, and are based on SQL SELECT statements. Each *condition* of a query is a WHERE clause in the SELECT statement.

  The eBAM Query Editor provides:

  - SQL-compliant visual tools for filtering and manipulating the data.
  - The ability to join two or more data definitions.
  - The ability to alter its filters according to input supplied dynamically at run time.

- **Charts**

  Charts are products that an eBAM application produces. Each chart is based a particular query:

  - Charts provide interactive visual representations of KPIs, and they update along with the data stream, serving up a dashboard of results for the business analyst or executive, accessible via a web browser.

    Each eBAM KPI queries and filters the results and communicates them to the GUI. The GUI provides the data view that best suits the user, such as an overall sense of business performance, or specific data trends or anomalies.

- **Alerts**

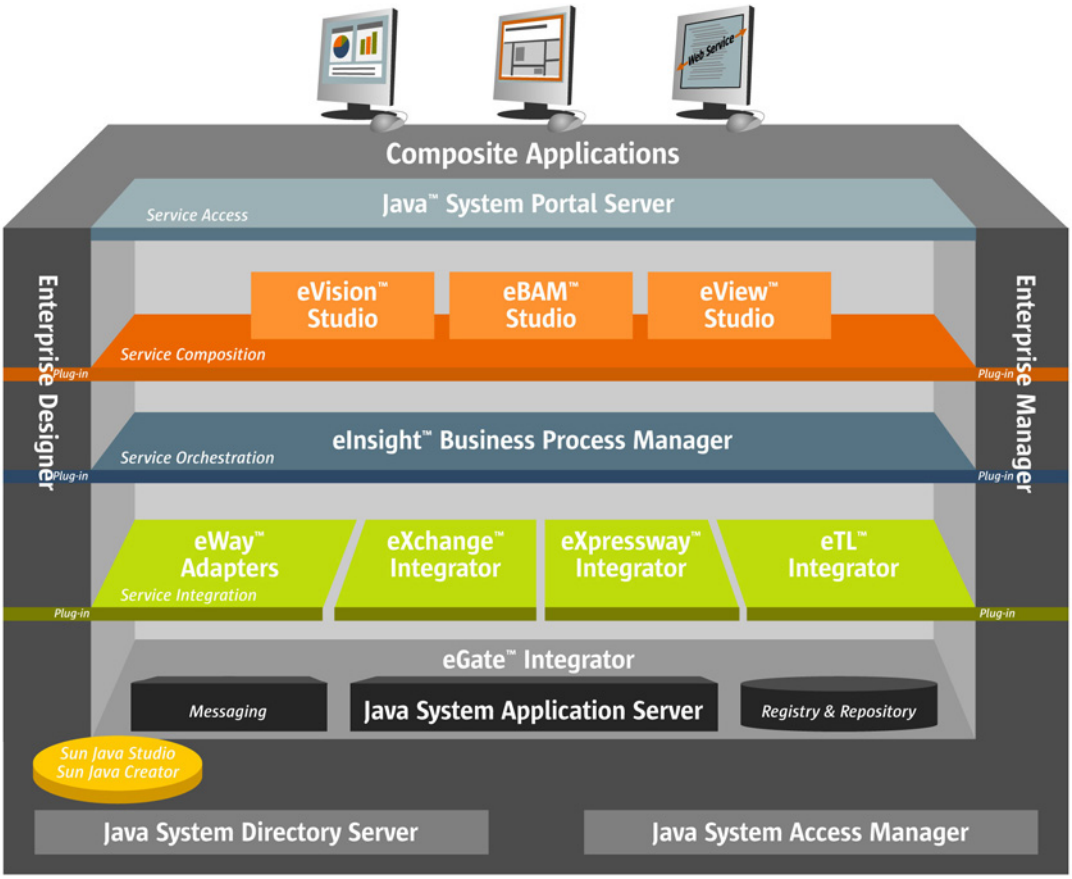
  Alerts are also products that an eBAM application produces. Each alert is based a particular query:

  - A simple email alert sends a specified message to a specified recipient whenever the results of the query meet a specified condition.
  - The *notify* web service of an alert can be used to trigger a business process to communicate data or a KPI when a query's results meet a specified condition.

## 2.3 eBAM and Java CAPS

eBAM's integration with Java CAPS is shown in Figure 1.

**Figure 1** eBAM Studio and Java CAPS




eBAM leverages other products and features in Java CAPS, including:

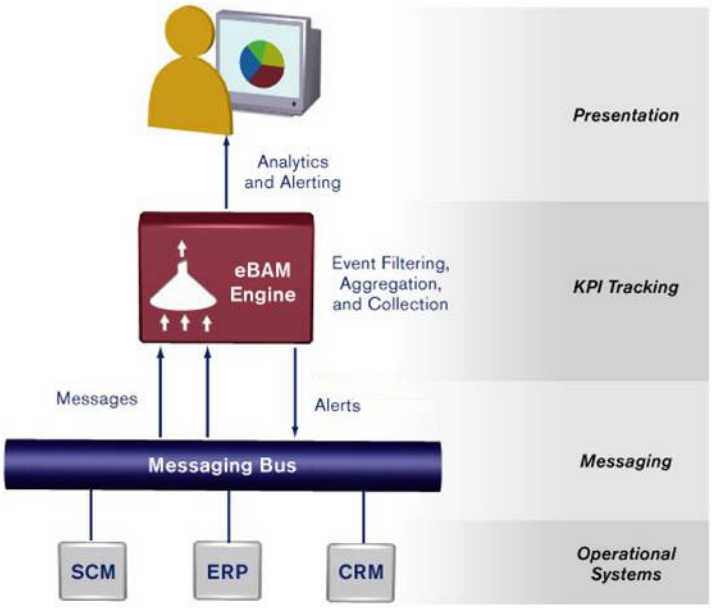
- The Enterprise Designer GUI is leveraged for the design of the data collection, graphical display, and notification processes.
- The eInsight Business Process Modeler is used for alert handling. **add**, **upsert**, and **delete**.
- Execute runtime resources are provided by the Integration Server/Application Server.
- Web applications created by eBAM Studio can be viewed either in a standalone browser or as an IFrame or portlet in the Sun Java System Portal Server.

## eBAM Data Flow

To allow for task differentiation, scalability, tunability, and maintainability/robustness, the eBAM data flow consists of a stack of separable layers (see Figure 2).

- The *presentation layer* provides a front-end GUI that allows business analysts to see only as much or as little as they decide to see, using the indicators they find meaningful, presented in the fashion they find most congenial.
- The *tracking layer* collects, aggregates, and filters data, passing periodic updates of the information-of-interest upwards to the presentation layer.
- The *messaging layer* communicates with external systems, mediated by eInsight's Business Processes.

**Figure 2** eBAM's Layers for Task Differentiation



Chapter 3

# Installing eBAM Studio

The eBAM Studio installation is similar to the basic Java CAPS installation. However, before proceeding with the installation of eBAM, ensure that you are aware of all of the prerequisites it requires and have first installed the major components of Java CAPS as discussed in the *Java Composite Application Platform Suite Installation Guide* (**CAPS_Install_Guide.pdf**).

**What's in This Chapter**



## 3.1 System Requirements

This section lists prerequisite products and related products. It also informs you which document contains the most up-to-date information on system requirements for each supported platform.

### 3.1.1 Prerequisite Java CAPS Products

The prerequisite Java CAPS products for installing eBAM 5.1.2 consist of the following:

- eGate Integrator 5.1.2 (**eGate.sar**)
- eInsight Business Process Manager 5.1.2 (**eInsight.sar**)
- eBAM Studio 5.1.2 (**eBAM.sar**)

If you want to use Oracle as your database for holding eBAM data (recommended), then the following Java CAPS product is also required:

- **OracleeWay.sar**

If you want to run the sample project and follow the steps provided in **Chapter 8**, then the following Java CAPS products are also required:

- **eBAMDocs.sar**
- **FileeWay.sar**

**eGate.sar** must be uploaded *before* uploading **eBAM.sar**; **eInsight.sar** and other SAR files can be uploaded along with **eBAM.sar**.

Complete instructions for uploading the SAR files and downloading the documentation and sample files are provided in **"Steps for Installing eBAM" on page 23**.

### 3.1.2 Related Products

Other products work in conjunction with eBAM but are not part of Java CAPS:

- Microsoft Internet Explorer—For viewing eBAM charts via a web browser.
- Oracle 9.2 or Oracle 10—Provides faster data processing and more reliable data access than the file-based database system supplied with eBAM; see **"Database Considerations" on page 47**.
- Sun Java System Application Server (AS) 8.1 EE—Provides an alternative to the SeeBeyond Integration Server.
- Sun Portal Server 6.3 or 7.0 (requires Sun Java AS)—Provides capabilities for viewing eBAM charts from within a portal.
- Database for data persistence / recoverability. If you use the eInsight Engine to persist data in the eInsight runtime recoverability database, see **"Persistence and Monitoring" on page 160**. Refer to the *Sun SeeBeyond eInsight Business Process Manager User's Guide* for information on database and platform support.

### 3.1.3 Supported Operating Systems

The **eBAM_Readme.txt** file on the product media contains the most up-to-date information on system requirements for each supported platform.

## 3.2 Steps for Installing eBAM

The steps for installing eBAM are the same as for other Java CAPS products. General product installation steps are provided in the *Java Composite Application Platform Suite Installation Guide* on the product media and accessible via the Suite Installer Documentation tab.

### 3.2.1 Uploading eBAM to the Repository

#### Before you begin

A Repository server must be running on the computer where you upload the eBAM product files, and **eGate.sar** must have already been uploaded to this Repository.

#### To upload eBAM product files to the Repository

1. On a Windows computer, start a web browser and point it at the computer and port where the Repository server is running:

   `http://<hostname>:<port>`

where

- *<hostname>* is the name of the computer running the Repository server.
- *<port>* is the starting port number assigned when the Repository was installed.

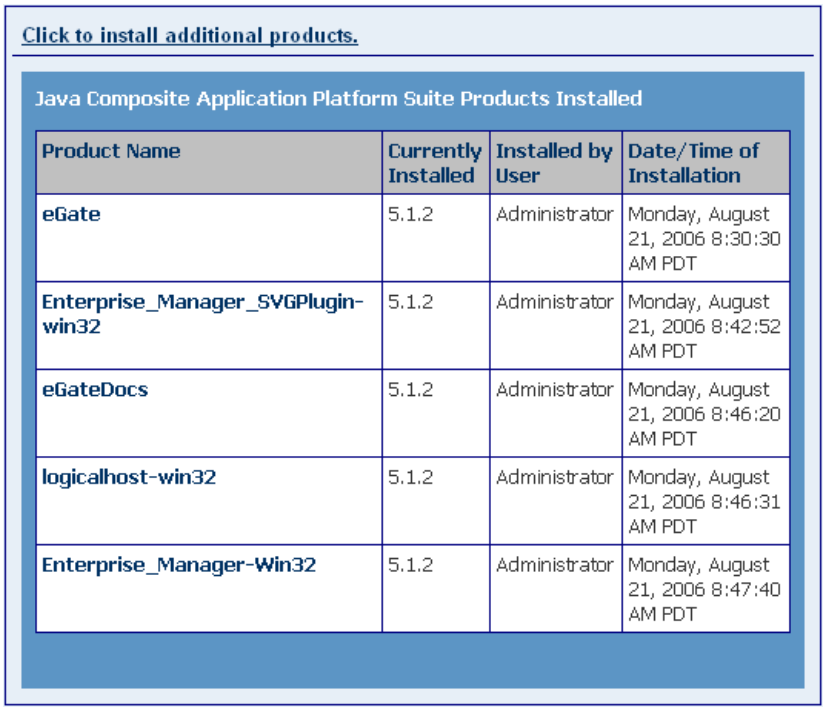
For example, the URL you enter might look like either of the following:

```
http://localhost:12000
http://serv1234.company.com:32000
```

2 When the Java CAPS Suite Installer becomes active enter your username and password on the **Java CAPS Login** window, and then click **Login**.

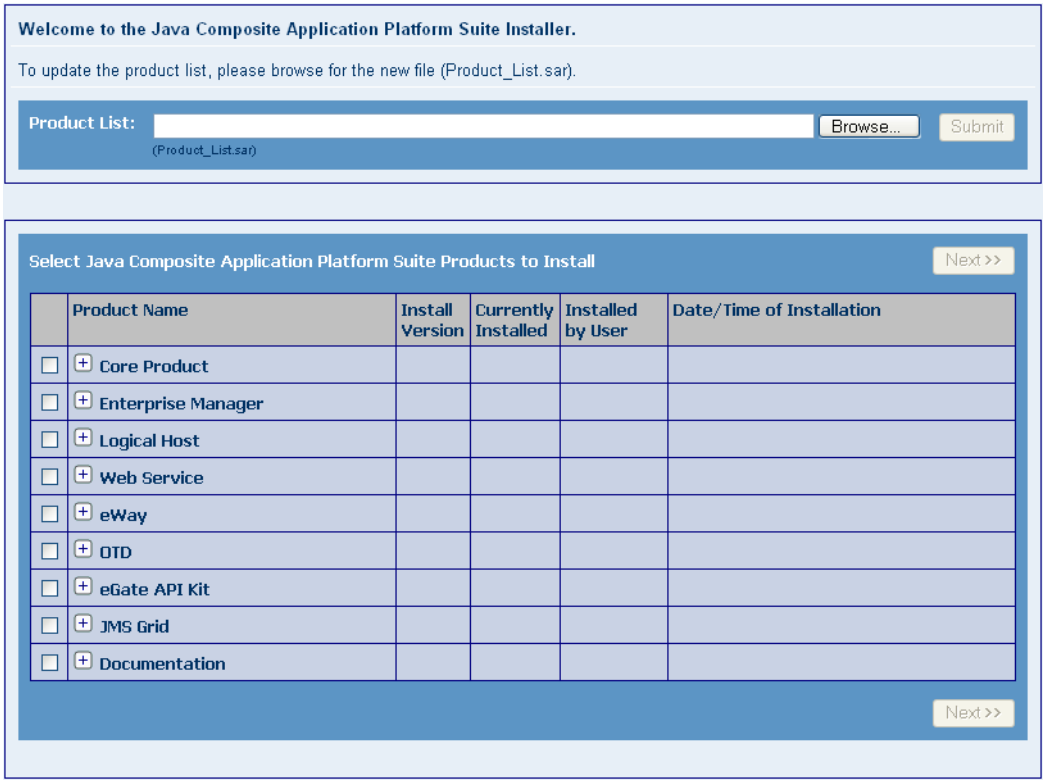
The Suite Installer defaults to the **Administration** tab and displays a list of the products you have already installed (see Figure 3).

**Figure 3** Java CAPS Products Installed




3 Select **Click to install additional products**. The Java CAPS List by Category appears (see Figure 4).

**Figure 4** Java CAPS Product List by Category




4 Open the appropriate product categories by clicking the "+" and select the check boxes FOR all of the following components/documentation that you have not previously uploaded:

Under Core Product:

- **eBAM**
- **eInsight**

Under eWay:

- **OracleWay** (if you use Oracle for faster data processing and reliability)
- **FileeWay** (if you plan to run the sample Project)

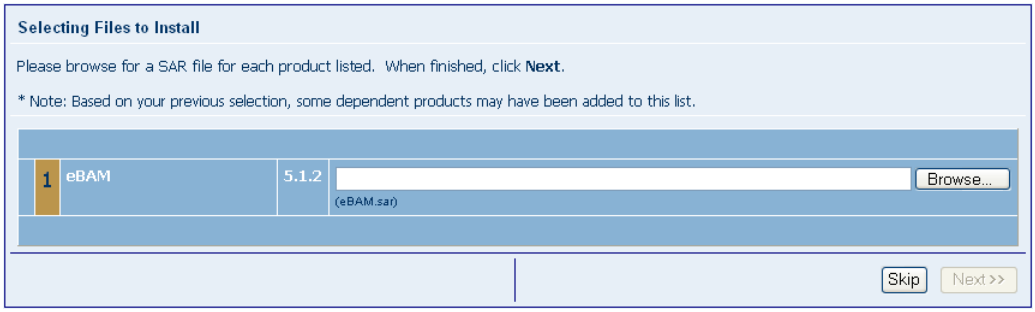
Under Documentation:

- **eBAMDocs** (if you plan to run the sample Project)

**Note:** ***eBAMDocs.sar*** *contains documentation and sample files. It is recommended that you upload the documentation for any components you upload (such as* ***eInsightDocs****). The File eWay is used in the sample implementation to read data from the files and write output.*

After making your selections, click **Next**. The Selecting Files to Install window appears (see Figure 5).

**Figure 5** Selecting Files to Install




5 Click the **Browse** to locate that appropriate SAR file (in this example: **eBAM.sar**), and select it. See Table 2 for the locations of the SAR files.

**Table 2** Locations of SAR Files Used in This Example

| SAR File | ISO Image | DVD Part Number |
|---|---|---|
| eBAM.sar | java-caps-5_1_2-products-cd2.iso | Part No. 708-0192-10 |
| eInsight.sar | java-caps-5_1_2-products-cd2.iso | Part No. 708-0192-10 |
| OracleeWay.sar | java-caps-5_1_2-products-cd3.iso | Part No. 708-0192-10 |
| FileeWay.sar | java-caps-5_1_2-products-cd3.iso | Part No. 708-0192-10 |
| eBAMDos.sar | java-caps-5_1_2-products-cd2.iso | Part No. 708-0192-10 |
| eInsightDos.sar | java-caps-5_1_2-products-cd2.iso | Part No. 708-0192-10 |
| FileeWayDocs.sar | java-caps-5_1_2-products-cd3.iso | Part No. 708-0192-10 |

Repeat this step for all of your selections, clicking **Next** after each selection.

The components install.

6 When the installation completes ("Installation finished" appears), select the **Downloads** tab and then the **Administration** tab to see a listing of what you have installed.

Your Repository can now serve the files in **eBAM.sar** to any Enterprise Designer that connects to it and uses the Update Center (see Figure 3, which has been appended with the additional installation data).

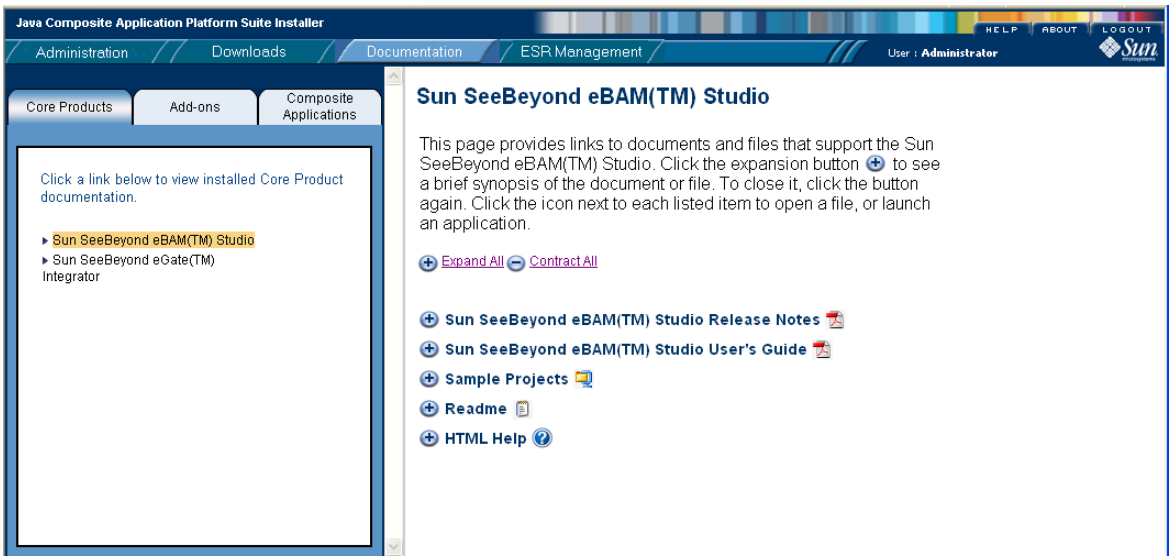
7 To view the documentation, click the **Documentation** tab. The Documentation page appears.

8 In the left pane, click the **Core Products** tab; and then click the product for which you want to view the documentation (for example: **Sun SeeBeyond eBAM Studio**).

**Note:** *Click the **Add-ons** tab to see the eWay documentation.*

The right pane is populated with all the PDF files, Readme text files, HTML files, Javadocs, and sample Projects that are associated with the selected product, and are ready to download (see Figure 6).

**Figure 6** Documentation Page After Selecting eBAM Studio




9 To download documentation and sample files, click the icons to the right of the corresponding text. For instructions on running the sample, see **"Sample and Tutorial" on page 70**.

## 3.2.2 Updating Enterprise Designer with eBAM

You must use Enterprise Designer's Update Center to complete the installation of eBAM. This process downloads the modules, verifies the digital signatures, and completes the installation.

### Before you begin

- Enterprise Designer has already been downloaded and installed.
- A Repository server is running on the computer where you uploaded the eBAM product files.

### To refresh an existing installation of Enterprise Designer

1 Start Enterprise Designer.

2 On the **Tools** menu, click **Update Center**. The Update Center Wizard appears.

3 When the Select Update Category wizard appears, click **Next**. The Select Updates to Install wizard appears, displaying a list of components ready for updating.

4 On the Select Updates to Install wizard, click **Add All** (the button with a doubled chevron pointing to the right) to move all the modules into the **Include in Install** list.

5 Click **Next** and, when the License Agreement appears, click **Accept**.

6 When the progress bars indicate the download has completed, click **Next**.

7 Review the certificates and installed modules listed on the next wizard, and then click **Finish**.

8 When prompted to restart Enterprise Designer, click **OK**.

When Enterprise Designer restarts, the installation of eBAM Studio is complete, and you can use all the provided eBAM tools.

Chapter 4

# Using eBAM Studio

Before beginning to use eBAM aFnd creating an application you should have a clear idea exactly what data you want to capture visually. Understanding the features of eBAM and how to use them is key for creating useful eBAM applications. The step-by-step instructions assume you are already familiar with GUIs such as the OTD Editor and eInsight Business Process Editor, and focus on the concepts and design-time GUI operations that are specific to eBAM.

**What's in This Chapter**



## 4.1 eBAM Applications

When you create an eBAM application the following considerations are important to keep in mind:

- *External data flow*—You must identify a source of data, decide how to bring it into the eBAM application (reading records from a file, accessing a topic, and so forth), and parse it using the **unmarshal** operation of the OTD that models your data. This is standard eGate methodology, and therefore not described in detail here.
- *Data definition*—For the parsed data, you must determine which data elements to pass to the eBAM application, and create names for the data elements of interest. The eBAM component you use to frame the data in this way is a data definition. Data within the eBAM application is controlled by the **add**, **upsert**, and **delete** activities; these web services are generated from the data definition.
- *Queries*—A query determines whether and how a data item or set is interesting. You use queries to set up one or more conditions that must be met before data is eligible for further processing by eBAM, and to calculate results (metrics, or KPIs). A *general* query typically sets the threshold for triggering an alert, and cannot be used for charts. A *summary* query returns data that can be used to construct simple charts, such as meters, pie charts, or one-dimensional trafficlights, and a specific

kind of bar chart. A *category* query returns data that can be used in trafficlights, bar charts, and pie charts, and the data is automatically grouped by category.

- *What to communicate*—For alerts, typically the only item to communicate is simply that the triggering condition was met, perhaps also providing the interesting result. For charts, you usually calculate a metric such as a key performance indicator (KPI), using a query to identify one or more fields and operations to create the metric you want to communicate.
- *How to communicate*—Each alert or chart is based on the result of a particular query.

  Alerts provide two distinct options: You can send an automatic email message, and/or you can place an alert's **notify** activity into a business process (BP) or page flow.

  For charts, you select a type (pie, bar, et cetera) and specify its properties (update frequency, size, color, font, spacing, and so forth). Charts are displayed in a special web application called the Charts Viewer, and can be viewed using a web browser or, if you deploy the application to a Sun Java System Application Server, using iFrames (with Portal Server 6 or 7) or portlets (with Portal Server 7 only).

## Components of an eBAM Application

Each eBAM application consists of one or more data definitions, one or more queries against the data definition(s), and one or more alerts or charts; each alert or chart is based on exactly one query. Table 3 shows the icons and web services for the components.

**Table 3** eBAM Application Components and Their Icons and Web Services

| Icon | Component and Associated Web Service(s) | For more information… |
|---|---|---|
|  | ***Data definitions*** are the infrastructure of the application. In them, you specify which data fields are of interest to you, and how to label and organize the data. In essence, the data definition specifies the column names and data types in a database table.<br>The **add** web service is provided by every data definition. Data definitions that bypass data retention provide two other web services: **upsert** and **delete**. | See **"Setting Up Data Definitions" on page 31**. |
|  <br>  | ***Queries*** are stored procedures run against accumulated data.<br>The **execute** web service provided by the query can be used as an activity in a business process (often using runtime input). | See **"About eBAM Queries" on page 53** and **"Setting Up the Application's Queries" on page 54**. |
|  <br>  | ***Alerts*** are triggered whenever a condition is met by one of the data items, such as exceeding a threshold. You can use an alert condition to trigger an automatic email.<br>The **notify** web service provided by the alert can be used in a business process or page flow, as the first activity that triggers subsequent processing. | See **"Setting Up the Application's Alert Conditions" on page 66**. |

**Table 3** eBAM Application Components and Their Icons and Web Services

| Icon | Component and Associated Web Service(s) | For more information… |
|---|---|---|
|  | ***Charts*** provide real-time feedback on the current data set according to conditions you specify.<br>Charts do not provide web services. | See **"About Charts" on page 68** and **"Chart Types" on page 154**. |

## 4.2 Setting Up Data Definitions

*Before you begin:* You must have a clear idea of the data you want to gather before you create the application, keeping in mind that the data definition specifies the column names and data types in a database table. You should know the answers to the following questions:

- Should the data be allowed to expire? If so, how many hours, days, months, or years should a dataset be retained, and how often should data cleanup occur?
- Altogether, how many data elements should be defined, and of what data type? Each data element must be of type **char**, **float**, **integer**, **timestamp**, or **varchar**.
- For each data element, what is the best descriptor? Each data element in an application must have a unique name; this is the name used when constructing conditions and charts, but is not necessarily the label that appears on the chart itself. The name you choose for a data element appears as the column heading for those data elements when you preview sample data.

In other words, be prepared with information whose form is similar to that of Table 4:

**Table 4** Metadata for Creating a Data Definition

| | Name | Data Type |
|---|---|---|
| 1 | OrderNum | integer |
| 2 | DateOfOrder | timestamp |
| 3 | CustName1 | varchar |
| (...) | (...) | (...) |
| n | TotalDollarsThisOrder | float |

### 4.2.1 Creating and Validating Data Definitions

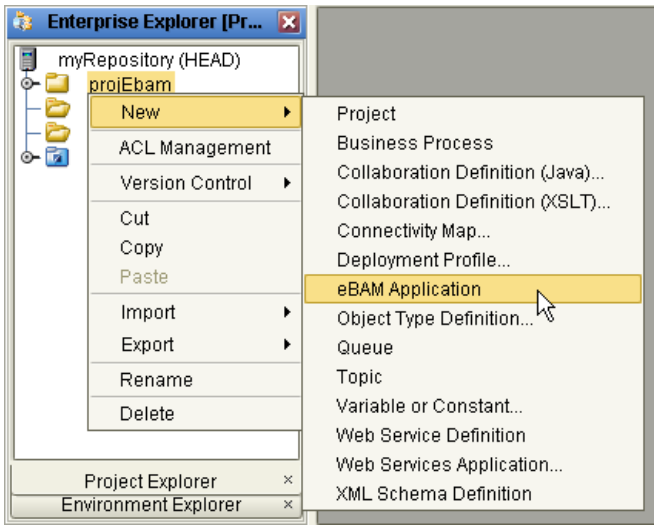
Data definitions can be created in two ways:

- As you create an eBAM application, you must also create its first data definition (see **"To create a new eBAM application and configure its first data definition" on page 32**).
- After you have created an eBAM application, you can add more data definitions (see **"To create and configure a new data definition in an existing application" on page 36**).

### To create a new eBAM application and configure its first data definition

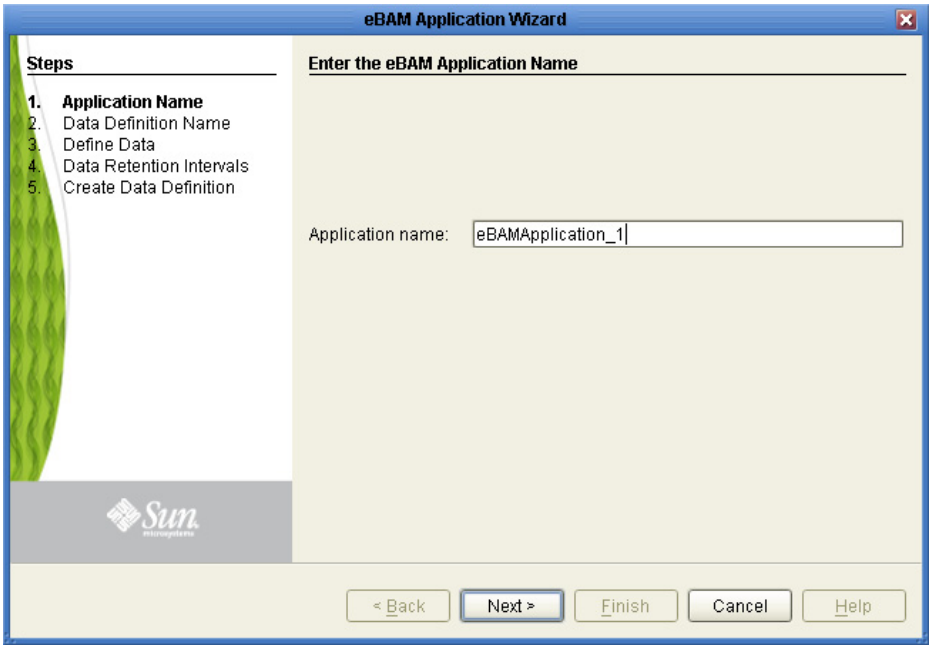
1 In Enterprise Designer, in the project tree (left pane), right-click the Project and, on the popup context menu, point at **New** and then click **eBAM Application** (see Figure 7).

**Figure 7** Creating a New eBAM Application



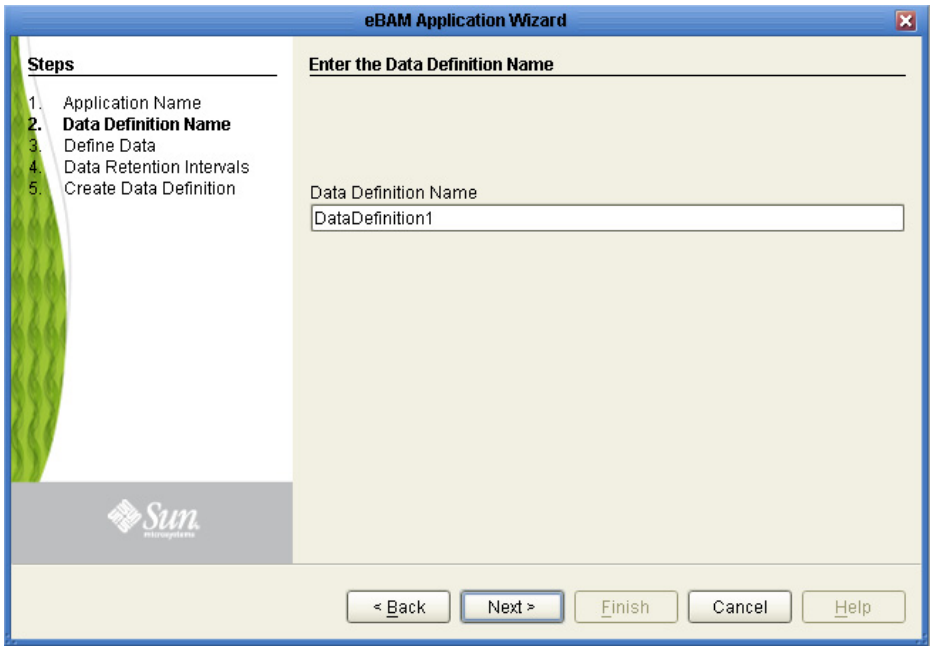

The eBAM Application Wizard opens (see Figure 8).

**Figure 8** eBAM Application Wizard - Enter the eBAM Application Name



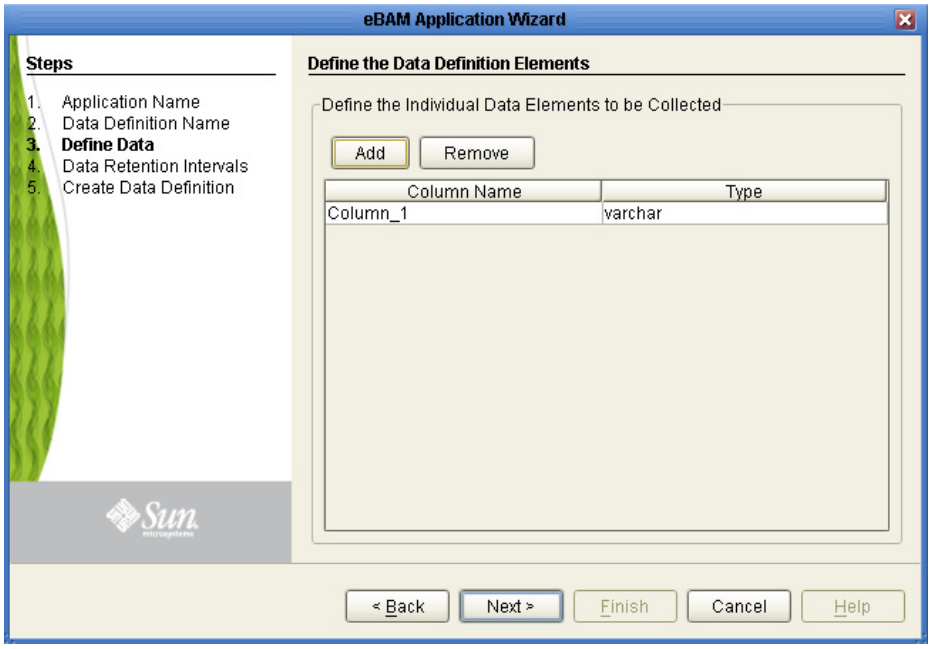

2 Keep the default name in the Application name field (eBAMApplication_1) or type a new name and then click **Next**. The eBAM Application - Enter the Data Definition Name wizard appears (see Figure 9).

**Figure 9** eBAM Application - Enter the Data Definition Name




3 In the Data Definition Name field, either keep the default name (DataDefinition1) or type a new name and then click **Next**. The eBAM Application - Define the Data Definition Elements wizard appears (see Figure 10).

**Figure 10** eBAM Application - Define the Data Definition Elements



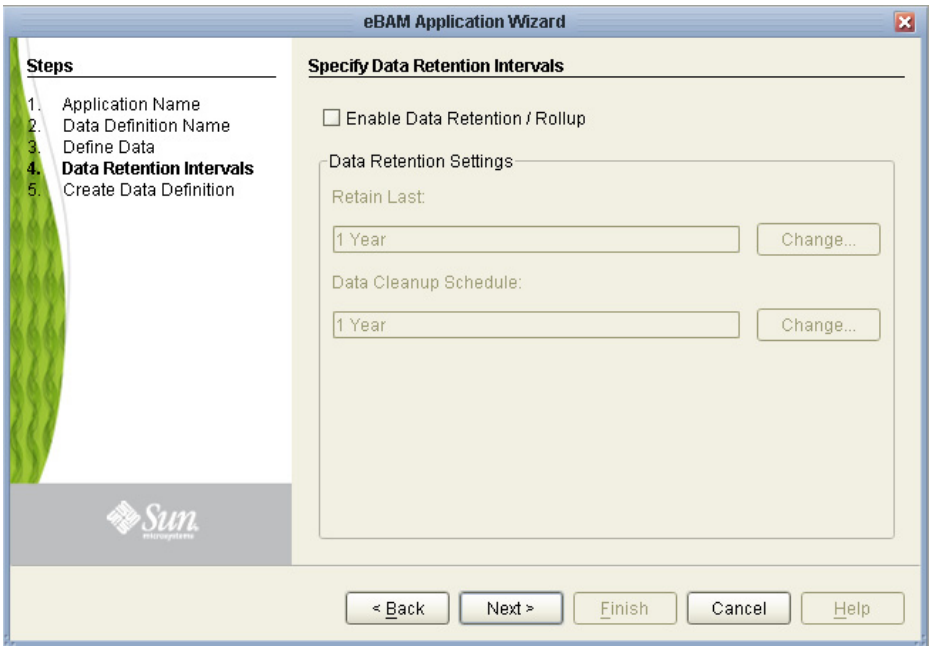

4 Before defining the data definition elements click **Add** several times, to create a number of columns. Next supply column names (by typing directly into the columns) and data types for the data elements (by opening the drop-down box and

making selections). Each column name must start with a letter followed by zero or more letters, numbers, or underscores.

**Note:** *If the order of the elements is important to you, double-check frequently to ensure you have not omitted an element—clicking **Add** appends each new item to the end. (However, order is unimportant to the queries.)*

As needed, click **Add** to append additional data elements or click **Remove** to remove unneeded ones. When you have specified the column name and data type of each data element your application gathers, click **Next**. The eBAM Application - Specify Data Retention Intervals wizard appears (see Figure 11).

**Figure 11** eBAM Application - Specify Data Retention Intervals




5 In the eBAM Application - Specify Data Retention Intervals wizard you bypass or specify Data Retention. To bypass, simply leave the check box cleared. If, instead, you select the "Enable Data Retention/Rollup" check box, you must specify two settings:

- **Retain Last**—How long data is allowed to age before it expires.
- **Data Cleanup Schedule**—How often to remove expired data from the database. These values cannot be greater than the **Retain Last** values.

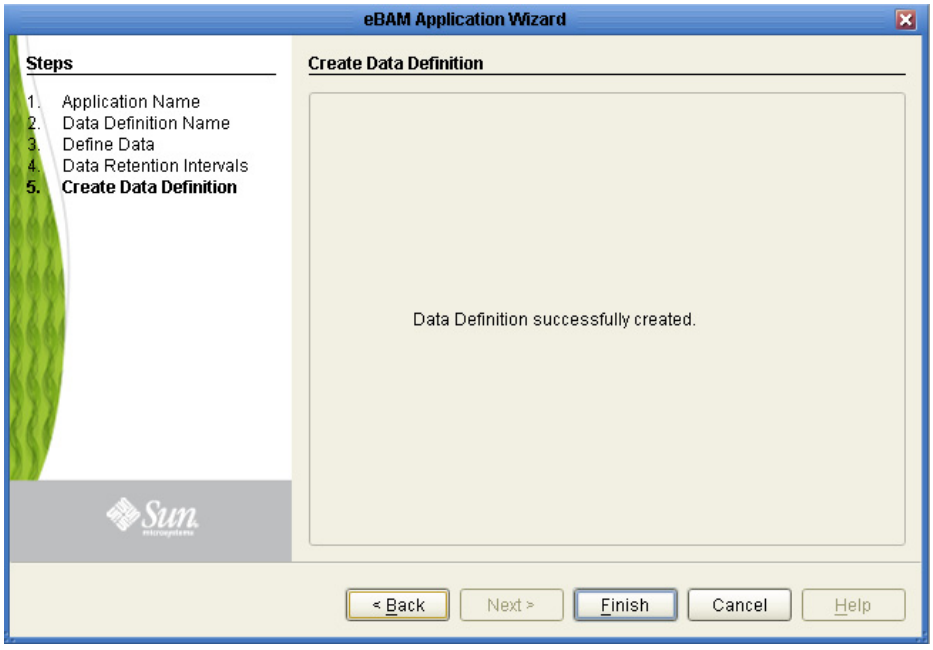
For example, to keep data for three months, set **Retain Last** to **3 Months**; to remove expired data every week, set **Data Cleanup Schedule** to **7 Days**.

**Note:** *If data retention is enabled for a data definition, it has only one web service: **add**. If it is bypassed, the data definition has three web services: **add**, **upsert**, and **delete**. Once data retention has been specified for a particular data definition, it cannot be un-specified: data retention parameters settings can be modified, but not disabled.*

When you have specified the settings, or have decided to bypass them, click **Next**. The eBAM Application - Create Data Definition wizard appears, and informs you: "Data Definition successfully created" (see Figure 12).

Even though the procedure informed you that the data definition has been created, the eBAM Application - Create Data Definition wizard allows you to go back and review your choices. As needed, click **Back** and **Next** to return to a step and make changes.

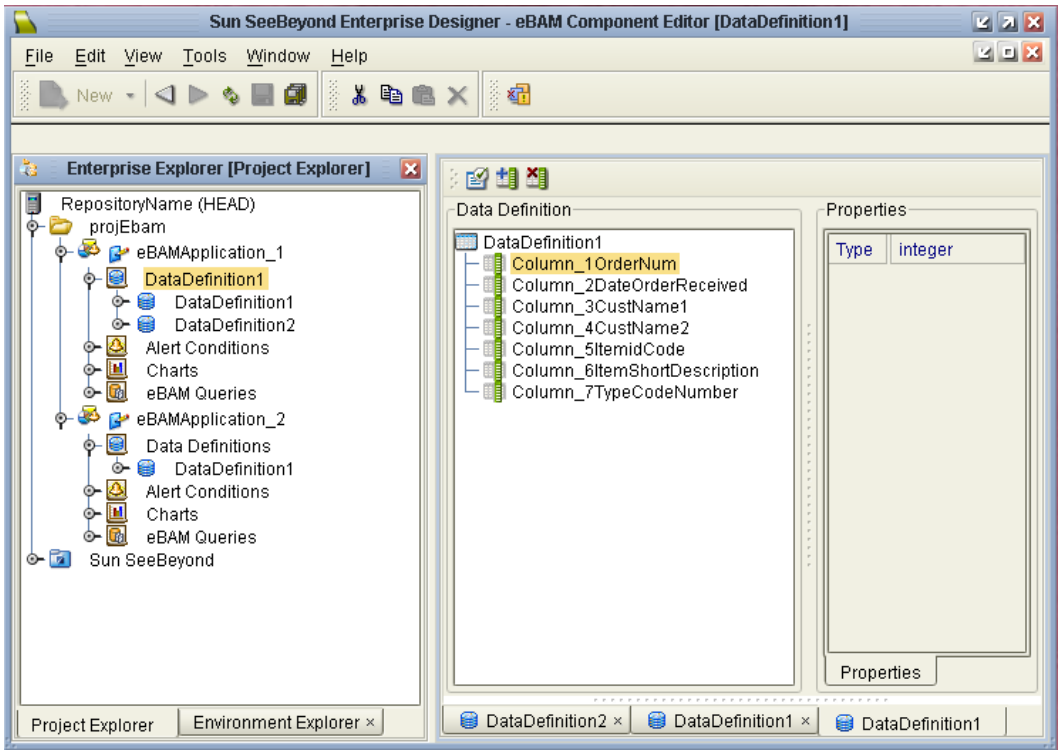
**Figure 12** eBAM Application - Create Data Definition




6 Click **Finish** when you are satisfied with the data definition.

In the left pane, the Project Explorer tree displays a new data definition under the eBAM application. On the right side (the canvas), the eBAM Component Editor opens to display the data definition.

**Figure 13** eBAM Component Editor Showing Data Definition




**Important:** *Any time you complete a new data definition, it is good practice to use the* ***Show Sample Data*** *tool to double-check the data definition against sample data. See* **"Importing Sample Data" on page 37**.

### To create and configure a new data definition in an existing application

This procedure is almost exactly the same as the one you followed when you created an eBAM application and its first data definition.

1. In Enterprise Designer, in the project tree (left pane), open an existing application, right-click its data definitions subfolder, and, on the pop-up context menu, click **New Data Definition**. The eBAM Application Wizard appears.
2. On the eBAM Application - Enter the Data Definition Name wizard, either keep the default name (DataDefinition2) or type a new name and then click **Next**. The eBAM Application - Define the Data Definition Elements wizard appears.
3. The rest of the procedure is the same as the preceding one. If you need additional information see **"To create a new eBAM application and configure its first data definition" on page 32**.

**Important:** *Any time you complete a new data definition, it is good practice to use the* ***Show Sample Data*** *tool to double-check the data definition against sample data. See* **"Importing Sample Data" on page 37**.

## 4.2.2 Modifying Data Definitions

Before modifying an existing data definition, refer to Table 5 to gain an understanding of what can be changed.

**Table 5** Ways of Modifying Data Definitions

| To change this… | … do this: | Notes and Caveats |
|---|---|---|
| Name of the data definition itself | In the Project Explorer tree, right-click the data definition name. Alternatively, in the Component Editor, click the data definition name, pause, and then click it again. | Data definition name changes are propagated automatically to any queries that use the data definition. |
| Data retention properties | In the Component Editor, click the data definition name and, in the Properties pane, change settings for Data Retention Time and/or Data Cleanup Interval. | Changes to data retention have no effect on any other properties of the data definition. If data retention is specified for a particular data definition, it cannot be removed. |
| Number of columns | In the Component Editor, use the buttons on the tool palette to add or remove columns:<br>  Add Column<br>  Remove Column | Do not add or remove columns if the data definition is already in use by any queries: the downstream impact can be severe, and very difficult to diagnose and remedy. |
| Column name | In the Component Editor, click the column name, pause, and then click it again. | Do not rename columns if the data definition is used by any queries. |
| Column datatype | In the Component Editor, click the column name and, in the Properties pane, change the setting for Type. | Do not modify a column's data type if the data definition is used by any queries. |

## 4.2.3 Importing Sample Data

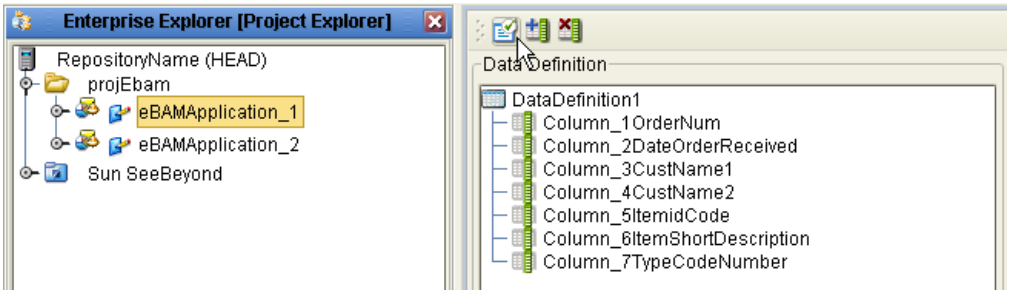
Sample data is useful when creating and testing your eBAM applications. Use imported sample data to validate data definitions, queries, charts that are created off of the queries, and alerts. Validation allows you to quickly see if the output is as you expected or if it is askew and needs reworking.

**To validate the metadata definition**

1. In the eBAM Editor, on the tool palette, click the **Show Sample Data** icon (see Figure 14 for the icon location on the eBAM Editor).

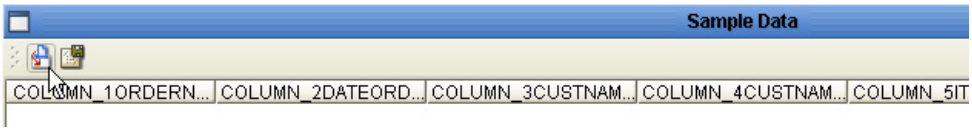
**Note:** *The eBAM Editor is the tool you use to create and edit your eBAM applications. The actions available at any given time vary depending upon what you have selected in eBAM.*

**Figure 14** Show Sample Data Icon on eBAM Editor Tool Palette




The Sample Data pane appears below the main eBAM Editor.

**Figure 15** Portion of the Sample Data Window




2 On the Sample Data tool palette, click the **Import** icon (see Figure 15). The Select File for Import wizard appears.

3 In the File Import wizard's **Select File** step, browse to the location of the sample data file and select it. The act of bringing the data file into eBAM creates a flatfile table that is located inside your Enterprise Designer directory (for example: **C:\JavaCAPS512\edesigner\usrdir\eBAmflatfiles ...** ).

4 In the formatting step, make the appropriate choices (see Table 6), and then click **Next**.

**Table 6** Specifying Formatting Type and Encoding for Imported Sample Data

| Item | Choices | Notes |
|---|---|---|
| Encoding scheme | ASCII (ISO646-US) | **ASCII** — 8-bit encoding, roman characters. |
| File format | Delimited<br>Fixed-width | Delimited files specify escape characters to distinguish fields in a record and one record from the next; fixed-width files specify a preset length for each record. |

5 In the parsing step, make the appropriate choices for delimited data (see Table 7) or fixed-width data (see Table 8), and then click **Next**.

**Table 7** Parsing Information for Imported Sample Delimited Data

| Item | Value | Notes |
|---|---|---|
| Default SQL Type | float<br>integer<br>char<br>timestamp<br><br>varchar | float — Number with decimal point, such as: **-99.99**<br>integer — Number without decimal point, such as: **-16777216**<br>char — Single printable character, such as: **A**<br>timestamp — Date and time in *ccyy-mm-dd hh:mm:ss* format, such as: **2006-12-31 23:59:59**<br>▪ *Note that Sun has expanded what the timestamp accepts such when you use eInsight's "get current time" option, which uses a slightly different format (2006-12-31T23:59:59.99z); the extra characters are stripped out and the format is converted to the default.*<br>**varchar** — Text string, such as: **This is a varchar example.**<br>▪ *Note that* **varchar** *is the default, works in most cases, even for all other data types, and should always work for you.* |
| Record Delimiter | {newline (lf)}<br>{cr}<br>{cr-lf} | **newline** — each new line starts a new record.<br>cr — each carriage-return starts a new record.<br>cr-lf — each carriage-return+linefeed starts a new record. |
| | You can also type in a character or control character; for example, to specify TAB, type in: \t | |
| Field Delimiter | {comma}<br>{tab}<br>{pipe} | **{comma}** — each instance of , starts a new field.<br>{tab} — each tab character starts a new record.<br>{pipe} — each instance of \| starts a new field. |
| Text Qualifier | none<br>“<br>' | You can indicate whether text is distinguished by quote marks; only double quotes or single quotes are supported. |
| First line contains field names? | False<br>True | You can indicate whether the first record of the data consists of labels for the fields. When this is set to **true**, the first line is used to name the fields, instead of being imported as data. |

**Table 8** Parsing Information for Imported Sample Fixed-Width Data

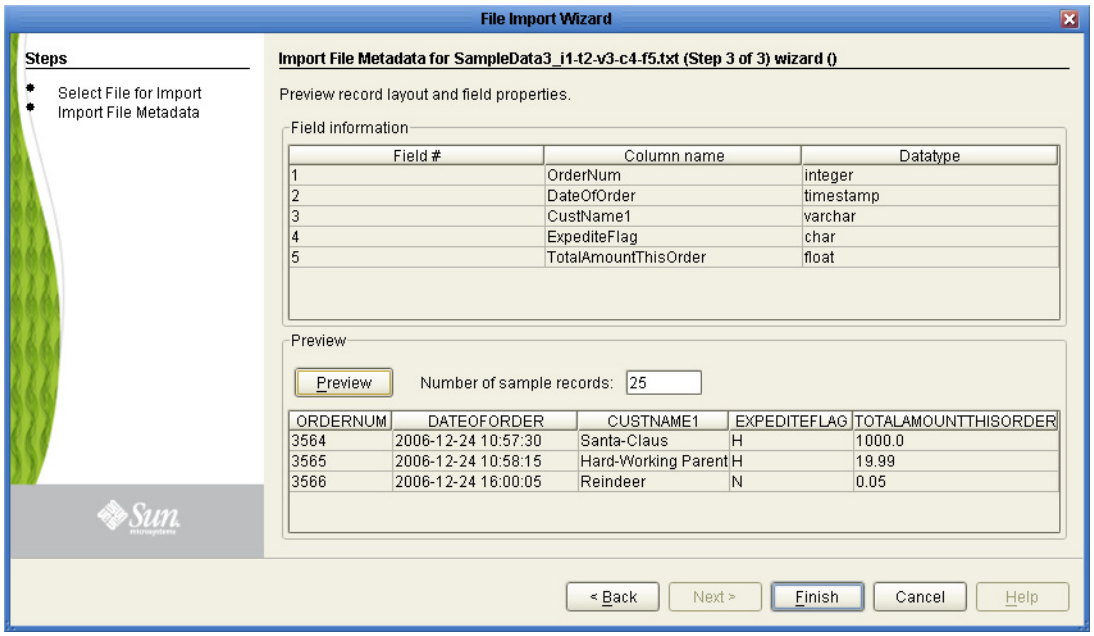
| Item | Value | Notes |
|---|---|---|
| Default SQL Type | float<br>integer<br>char<br>timestamp<br><br>varchar | float — A number with a decimal point, such as: **-99.99**<br>integer — A whole number, such as: **-16777216**<br>char — A single printable character, such as: **A**<br>timestamp — A date and time in *ccyy-mm-dd hh:mm:ss* format, such as: **2006-12-31 23:59:59**<br>▪ *Note that Sun has expanded what the timestamp accepts such when you use eInsight's "get current time" option, which uses a slightly different format (2006-12-31T23:59:59.99z); the extra characters are stripped out and the format is converted to the default.*<br>**varchar** — Text string, such as: **This is a typical text string.**<br>▪ *Note that* **varchar** *is the default, works in most cases, even for all other data types, and should always work for you.* |

**Table 8** Parsing Information for Imported Sample Fixed-Width Data (Continued)

| Item | Value | Notes |
|---|---|---|
| Record Length | 0 | To override the default, type in a nonzero number. |
| HeaderBytesOffset | 0 | To override the default, type in a nonzero number. |

6 In the next step, verify the record layout and field properties in the Field information pane, enter the number of sample records to read and display in the preview pane, and then click **Preview**. See Figure 16, or **Figure 50 on page 81**.

**Figure 16** Show Sample: Preview of Field Layout

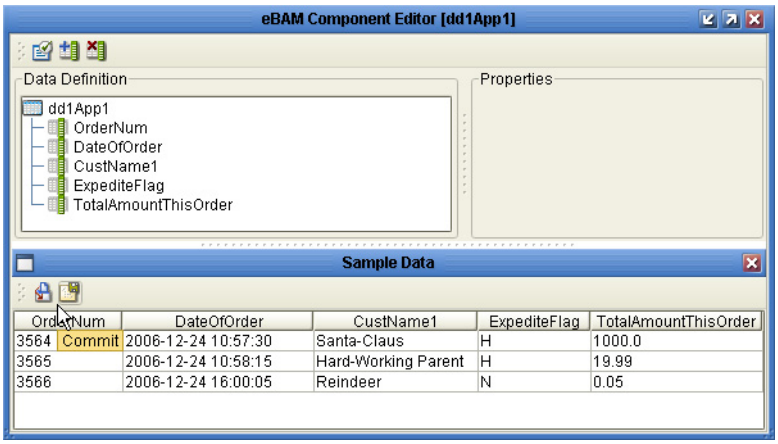



If the sample data is valid (that is, in accord with the layout, encoding, formatting, and properties you specified), the Preview pane displays a table whose rows are the first few records, with each column headed by the data element name.

7 As needed, you can click **Back** and **Next** to return to a step and make changes to layout or formatting, or specify a different input file. When satisfied, click **Finish**.

The entire data set is parsed and displayed in the Sample Data pane. For examples, see **Figure 51 on page 82** and Figure 17.

**Figure 17** Sample Data Displayed in eBAM Component Editor




8 When ready, click **Commit** to create your sample.

This allows the sample data to be used in a query, but only for design time; the "remembered" data has no effect whatsoever on run time.

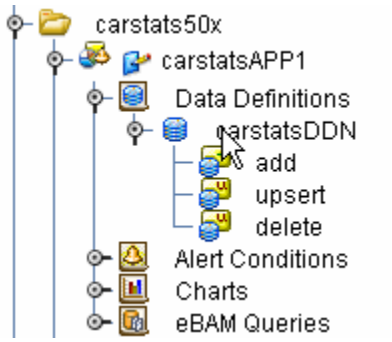
**Note:** *You can edit-in-place any of the contents of the sample data cells.*

## 4.2.4 Add, Update, and Delete Data From the eBAM Data Store

Once an eBAM application is created, it makes available a web service named **add** that can be used in an eInsight business process. For an example, see **Figure 72 on page 100** and **"Adding New Data" on page 114**.

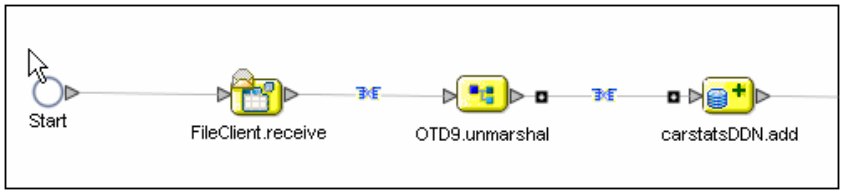
If you use data retention, only the **add** web service is available. However, if you do not have data retention, three web services become available. In addition to **add**, the two other web services are **upsert** and **delete**. In our example (see Figure 18) the eBAM application is carstatsAPP1 and the DDN is carstatsDNN. The three web services are under carstatsDNN.

**Figure 18** Three Data Definitions




You use these web services in an eInsight business process by dragging them onto the canvas (see Figure 19).

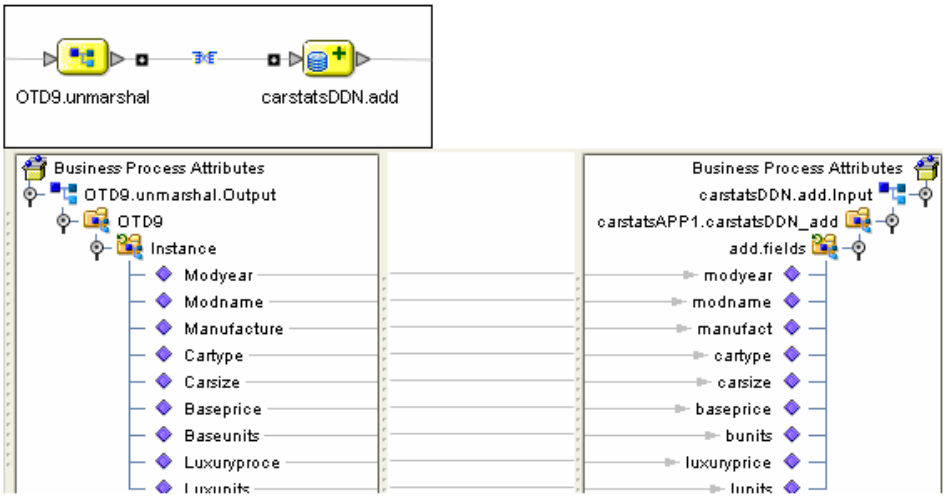
**Figure 19** Example of Dragging an Add Web Service




## The ADD Web Service

The **add** web service has inputs for every data column in the DDN. In the following illustration (see Figure 20) we see the OTD with nine fields. It is connected to the **add** service via a business rule.

**Figure 20** OTD with Nine Fields Connected to an Add Service



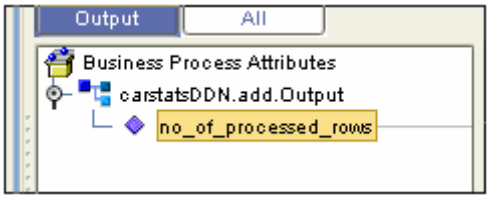

In the eInsight Business Rules Designer, when you open all subnodes beneath the <*appname*>_ **add.Input** node, the fields under the **add.fields** element display the data definition fields to which data can be mapped. Mapping data into these fields during run time causes eBAM to add additional records to the dataset used for its charts, queries, and alerts.

In the example, the User Defined OTD had a repeating node element, which contained nine fields. The nine fields were mapped to the **add.fields** node of the **carstatsAPP1.carstatsDDN_add** node of the **carstatsDDN.add.Input**.

The **add** service also generates output (see Figure 21). Every time the **add** service is executed, it returns an integer value of the number of rows that were added to the table. There is no requirement to use this output; it is there as a convenience if desired.

**Note:** ***upsert*** *and* ***delete*** *also have* ***no_of_processed_rows*** *available as an output.*

**Figure 21** Add Service Output




## The UPSERT Web Service

Use the **upsert** service to modify existing records, or to add new records.

The **upsert** web service for an eBAM data definition has two properties. The first property is a group of all fields in the data definition, and the second property, the WHERE clause, is used to define the condition which determines whether an existing record will be updated or a new record inserted. The condition is defined using standard SQL notations.

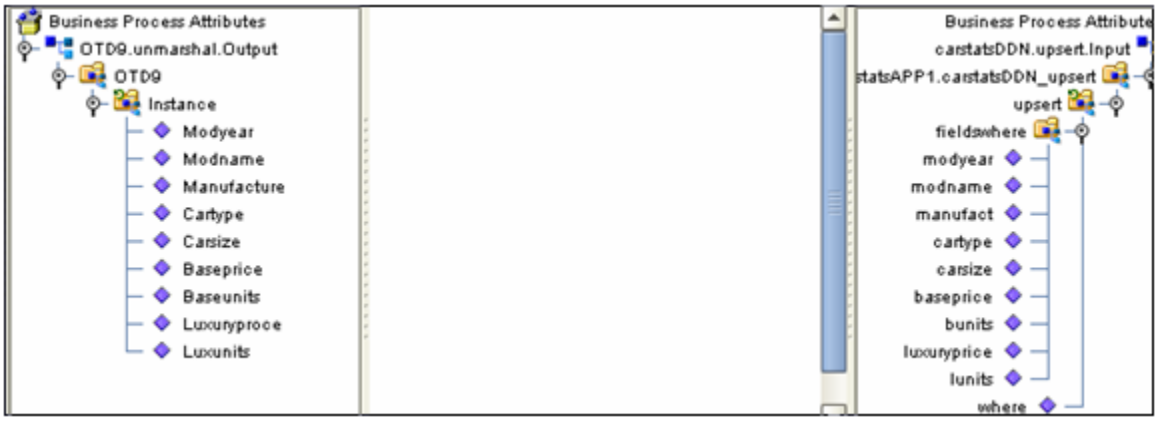
**Note:** *The WHERE clause must follow SQL syntax conventions.*

To modify an existing record, drag the **upsert** onto the canvas, connect to the OTD unmarshal, and add a business rule (see Figure 22).

**Figure 22** Example of Attaching Upsert to an OTD Unmarshal


At this point you have not mapped anything (see Figure 23).

**Figure 23** Example of an Unmapped OTD



Begin mapping the fields. You can map every one of them, or you can choose to map some of them. The fields you map determine which columns are updated in the record (see Figure 24 and Figure 25).

**Figure 24** Example of a Mapped Field

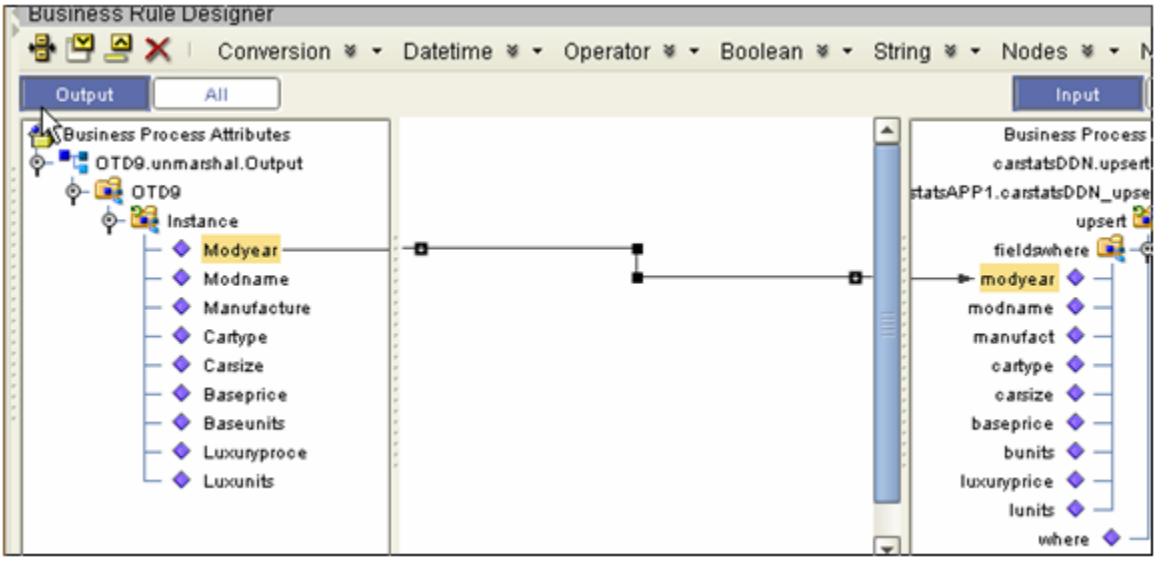
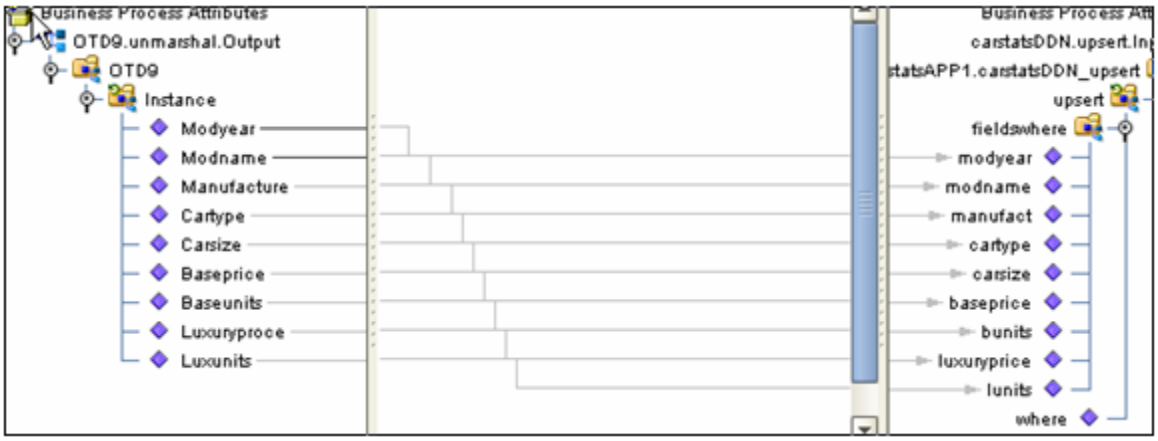
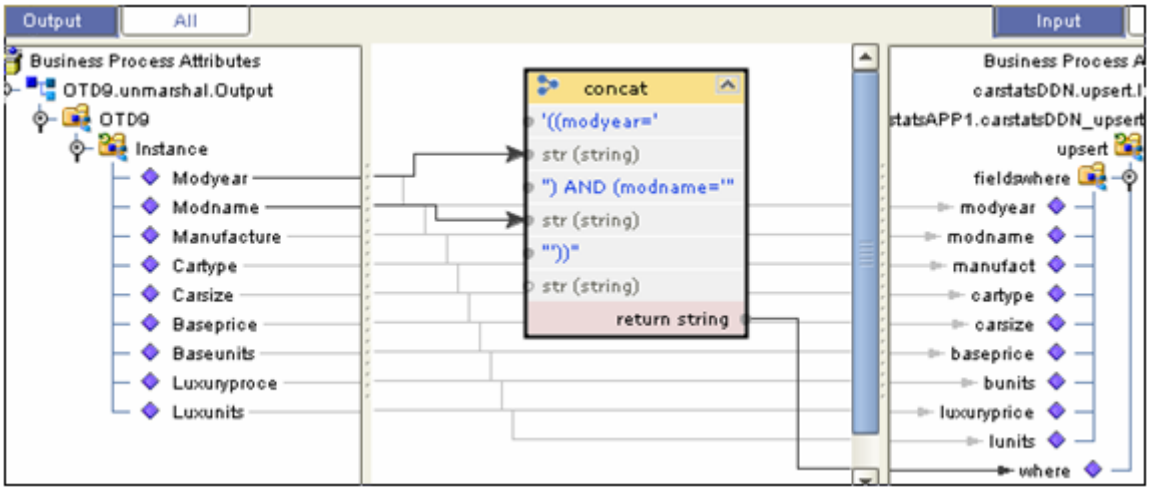



**Figure 25** Example With All Fields Mapped




After all the fields have been mapped, you are ready to add a WHERE clause; in this example: **((modyear=<ModYear>) AND (modname=<Modname>))**. We determined the column names 'modyear' and 'modname' from examining the original DDN. The variable values came from each record as it appeared in the unmarshalled data (see Figure 26).

**Figure 26** Mapped Example with WHERE Clause




The condition is executed on a record-by-record basis from the unmarshalled output of the OTD. If a matching record, as defined by the condition in the WHERE clause, is found in the existing eBAM table, an update occurs. If there is no match for the WHERE clause, then a new record is added, or inserted, into the eBAM database.

If a WHERE clause is not used, the **upsert** web service acts exactly like the **add** service.

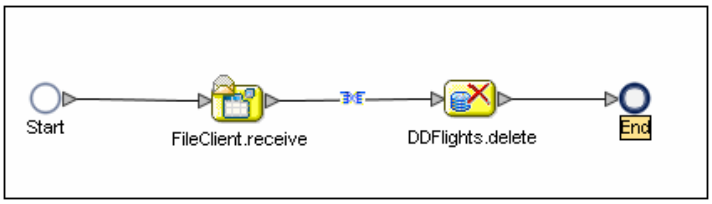
**Note:** *As with **add** and **delete**, **upsert** also has **no_of_processed_rows** available as an output.*

## The DELETE Web Service

The **delete** web service works in a similar way to how the **upsert** service works. A WHERE clause is specified via the business rules mapper. Any rows that meet the WHERE clause condition are deleted from the eBAM database table.

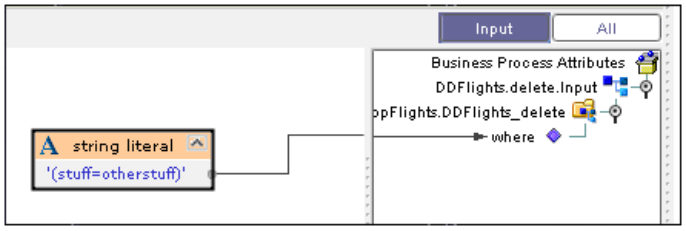
To begin the process of deleting rows from an eBAM database table, drag the delete service onto the canvas and attach it (see Figure 27).

**Figure 27** Example of Dragging a Delete Web Service



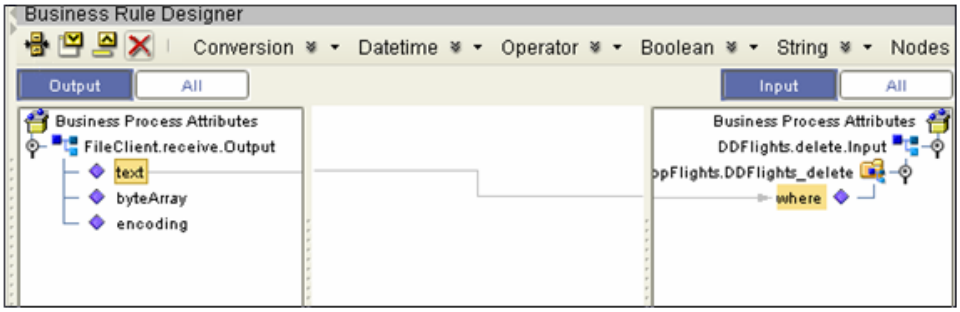

In our first example, when the file triggers the business process, a WHERE clause is triggered that is the same every time (see Figure 28).

**Figure 28** Example of a WHERE Clause



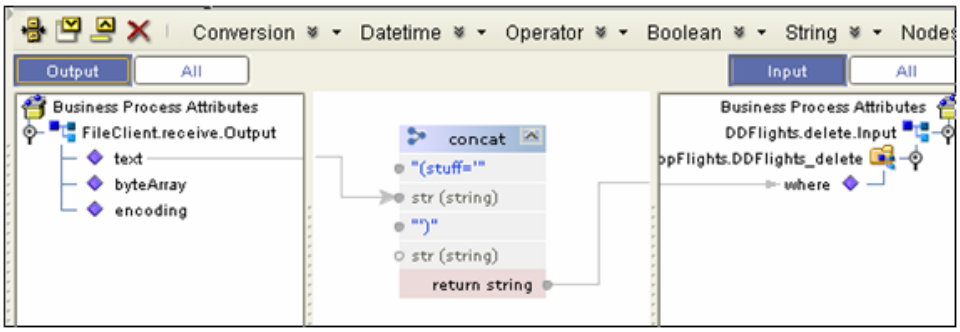

In the second example, the text contained in the file becomes the entire WHERE clause (see Figure 29).

**Figure 29** Example Where the Text Becomes the Entire WHERE Clause




In the third example, the text in the input file acts as a variable value, a runtime argument if you will, and is combined into another string to form the WHERE clause (see Figure 30).

**Figure 30** Example Where Text Becomes a Variable Value




If a **delete** web service is invoked without using a WHERE clause, all the rows in the table are deleted. The table remains, but without any records in it.

The **delete** web service deletes individual records, but it does not delete the table definition, and it cannot drop a table.

**Note:** *As with **add** and **upsert**, **delete** also has **no_of_processed_rows** available as an output.*

# 4.3 Database Considerations

Although you can use eBAM without a formal database (see **"Using the Default Flatfile Database" on page 47**), best practice is to use eBAM in conjunction with an Oracle database, as discussed in **"Using eBAM with an Oracle Database" on page 48**. Regardless of whether you use a "virtual database" flatfile or a actual Oracle database, setup and configuration steps are minimal, and you do not need to run any database scripts.

**Note:** *The database considerations discussed in this section are unrelated to the eInsight database used for persistence; for information on the eInsight database and the eInsight engine, see* **"Persistence and Monitoring" on page 160**.

## 4.3.1 Using the Default Flatfile Database

You can deploy eBAM applications using a "virtual database" wherein data is persisted via a flatfile. This means you do not need to take any special setup or configuration steps except to supply a valid writable directory name as a value for "Application Workspace Directory" in the properties of each application server where you deploy the application.

In this case, each eBAM application uses a "virtual database" that is specific to the Project name and deployment name. Therefore, if you activate the same application using two or more deployment profiles, or if you copy and paste an eBAM application to a different project, each application deployment instance is unaware of any others, and data is not shared from one to another. Similarly, if you rename a Project, activation of this "new" Project creates a new workspace that is unaware of any data gathered under the previous name.

**Note:** *This is the same database technology used in design time.*

### Flatfile Database Considerations

- Releasing the Database Lock

  Occasionally after an unplanned integration server shut down, or rarely after redeploy of the Project, the flatfile database becomes inaccessible. When this happens an error in the log file indicates that you need to delete the **lockfile.txt** file, which is located in the `/<Application Workspace Directory>/<projectname_deploymentname>` directory.

- Deleting the eBAM data Repository

  To completely clean out your eBAM data Repository, delete the entire `/<Application Workspace Directory>/<projectname_deploymentname>` directory, and then restart your Logical Host.

## 4.3.2 Using eBAM with an Oracle Database

To use eBAM in conjunction with an Oracle database, you must have installed the Oracle eWay, you must be able to access the Oracle database with appropriate user privileges, you must have one or more well-configured Oracle externals in your environment, and you must connect your eBAM application instances to Oracle externals in the Connectivity Map.

This section provides a brief summary of the default configuration used by the Oracle eWay; for full information, see the *Sun SeeBeyond eWay™ Adapter for Oracle User's Guide.*

### Oracle Database Considerations

eBAM applications that use an Oracle database, as opposed to the "virtual database" flatfile (see 4.3.1**"Using the Default Flatfile Database" on page 47**) have the following characteristics:

- At run time, a database connection is established if and only if the database is running and the configuration parameters of the Oracle external are validated (in other words: servername, databasename, user ID, and password).
- Multiple eBAM applications, in the same or different Java CAPS Projects, can share the same Oracle database.
- The Oracle database user should have the ability to create and drop tables.
- eBAM data in the Oracle database is stored according to database user information. Therefore, renaming the Project or deployment profile has no effect on data known to the application, and different instances of the same eBAM application—such as a single application deployed via multiple deployment profiles to the same environment, or an application copied into another Project but deployed to the same environment, or even an application imported to another Repository but deployed in such a way as to reference the same database—share the same data, just so long as they point at the same database via the same user ID and password. Records written by one such application instance are visible and accessible to all such instances.
- Tables are created automatically as needed, and accessed during run time according to the parameters of the application's data definition(s).

  There are three types of tables created by eBAM:

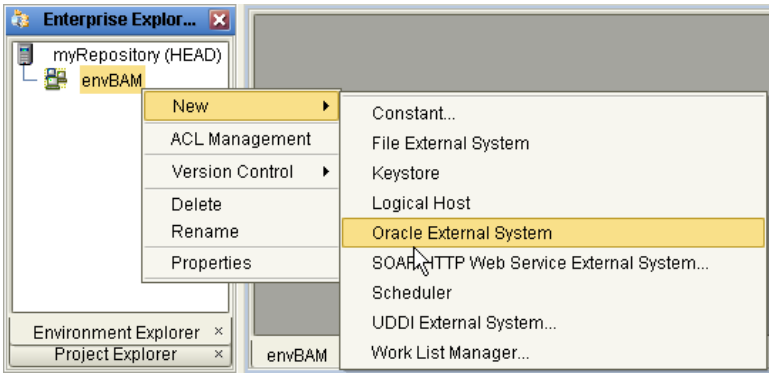
  - *Alert*: A table that contains timestamp information on when alerts have been sent.
  - *EBAMINT11_11*: A table that contains information eBAM uses for table creation.
  - *Data tables*: A separate table is created for each data definition in the eBAM application.
- Each data definition is assigned a unique internal name by eBAM, and this internal name is used as the table name during run time. To determine this name, open a query that is using that DDN and select the **Shows SQL** option. Thus, if you ever need to learn the name of the table (such as for troubleshooting purposes), you can read it from the SQL of the query.

- If you are using Oracle 10*g*, tables are actually *dropped*, instead of being deleted or purged from the database. Purging or archival of stale data must be managed by your Oracle database administrator. (Standard practice is to use this feature as a recycling bin: The tablespace is allowed to grow until it reaches the autogrow limit, and then the oldest version of the table is purged.)
- Under certain circumstances eBAM will drop tables when a data definition is modified, but it does not drop tables when you undeploy a Project. When eBAM is no longer in use, an Oracle database administrator (or your company's equivalent) must manually delete any tables that are no longer needed.
- The computer which runs the Application Server does not need to have an Oracle client installed.

**To create and configure a new Oracle external in the Environment**

1 In Enterprise Designer, Environment Explorer tab, right-click the environment and, on the pop-up context menu, point at New, and click Oracle External System. See Figure 31.

**Figure 31** Creating a new Oracle External



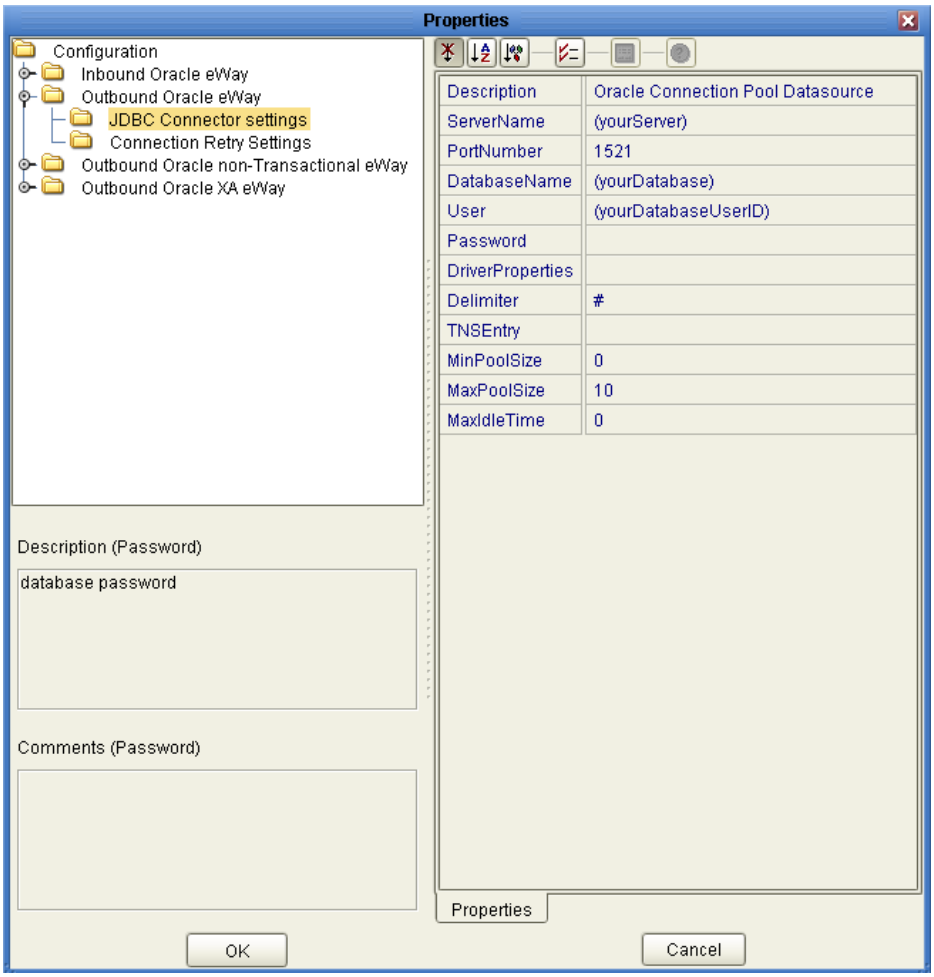

2 Provide a name and click **OK**.

3 In the Environment tree, right-click the newly created Oracle external and, on the pop-up context menu, click **Properties**.

4 In Outbound (under "JDBC Connector settings"), configure the properties appropriately. At a minimum, you need to supply valid settings for **ServerName**, **DatabaseName**, **User**, and **Password** (see Figure 32). The Properties dialog box appears.

**Note:** *For complete information on the configurable properties of the Oracle external, refer to the Sun SeeBeyond eWay™ Adapter for Oracle User's Guide.*

**Figure 32** Configuring an Oracle External

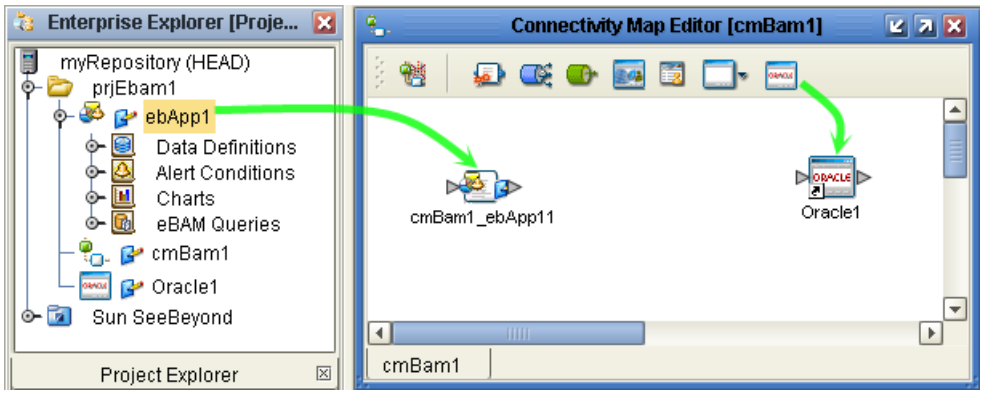



5 When finished setting the properties, click **OK**.

### To connect an eBAM application to an Oracle external on the Connectivity Map

1 In Enterprise Designer, if you have not already done so, drag an instance of the eBAM application from the Project Explorer tree onto the Connectivity Map, and drag an instance of the Oracle external from the tool palette down onto the Connectivity Map. See Figure 33.

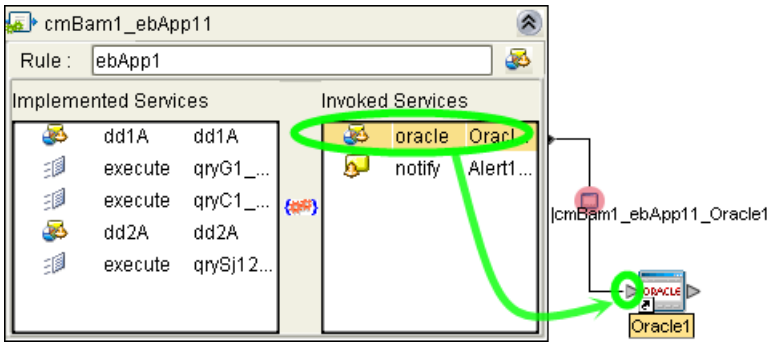
**Figure 33** eBAM Application and Oracle External on a Connectivity Map




2 Double-click the eBAM application instance and drag its Oracle service (on the right side, under Invoked Services) to the inbound arrow of the Oracle external.

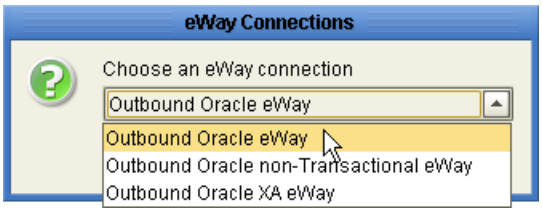
The connection is created, but the Oracle eWay appears as a red dot, since it has not yet been configured. See Figure 34.

**Figure 34** Connecting an eBAM Application's "oracle" Service to an Oracle External




3 Double-click the red dot ("cmBam1_ebApp11_Oracle1" in the example in Figure 34). The eWay Connections drop down list that appears (see Figure 35).

**Figure 35** Choosing the Outbound Oracle eWay Connection Type




4 Select **Outbound Oracle eWay** and then click **OK**. This creates the Outbound Oracle eWay.

**Note:** *For complete information on the configurable properties of the Oracle eWay, see the* ***Sun SeeBeyond eWay™ Adapter for Oracle User's Guide****.*

5 In the Properties dialog box, unless you want to modify the default configuration parameters, simply click **OK**. (The default configuration is the simplest one.)

Chapter 5

# Using eBAM Queries

eBAM applications use queries. Before setting up and using queries in eBAM you should understand how they function. The step-by-step instructions for creating, configuring, and using queries in eBAM applications assume you are already familiar with Enterprise Designer and such eBAM concepts as data definitions.

**What's in This Chapter**



## 5.1 About eBAM Queries

Queries are used in three ways by eBAM:

- As part of a Chart definition
- As part of an Alert definition
- As a standalone web service, embedded in an eInsight business process

In SQL terms, an eBAM query is a SELECT statement, and each condition is a WHERE clause. When the Query wizard prompts you to select the data definition(s), it uses them to create the SELECT statements; when you use the Condition Builder, the Query Editor adds a WHERE clause to the SQL statement.

Queries come in three forms: *summary, category, and general*:

- Summary queries use only the first line of the returned data, and are used for simple charts: meters, pie charts, and simple trafficlights and bar charts.
- Category queries provide automatic data grouping into categories, and are used by traffliclight arrays, pie charts, and bar charts.
- General queries create SELECT statements without any restrictions on returned data (unlike the summary query) and without restrictions on format (unlike the category query), and they allow you to use runtime arguments as variables in their WHERE clauses. However, general queries cannot be used for charts.

# 5.2 Setting Up the Application's Queries

Each eBAM query consists of the following:

- A condition type, a name, and one or more data definitions. These are set when you run the wizard that creates the query. See **"To create a new query"** below.
- Optionally, one or more runtime arguments; see **"To add or modify runtime inputs to a configured query" on page 55** and **"Using the Condition Editor" on page 60**. (In SQL terms, a "runtime argument" is a variable in a WHERE clause.)
- One or more conditions, using fields in the data definition; see **"To use runtime arguments in the Condition Editor" on page 56** and **"Using the Condition Editor" on page 60**. (In SQL terms, a "condition" is a WHERE clause.)
- One or more fields in the dataset, with appropriate mappings to them from operators and data definition fields; see **"To configure the dataset, mapping operators and data definition fields to its fields" on page 57**. (The term "dataset" refers to the output columns of the SQL SELECT statement.)
- Optional settings for the query's characteristics as a whole. These consist of Group-By (aggregation) mappings and Order-By (sort) mappings; see **"To configure Group-By and Order-By characteristics of the entire query" on page 58**.

### To create a new query

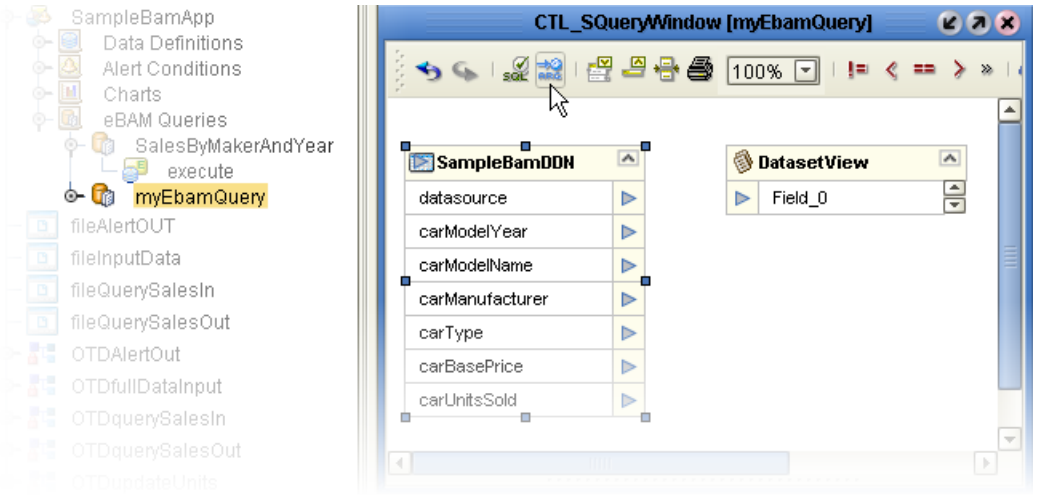
1. In the project tree, under the eBAM application, right-click **eBAM Queries** and, on the popup context menu, click: **New eBAM Query**
2. In step 1 of the Query wizard, specify condition type (general, summary, or category) and a name.

   After a query is created, you can change its name up until the time it is used as the basis for a chart or alert, but you cannot change its condition type.
3. In step 2 of the wizard, select one or more check boxes for the data definition.

   After a query is created, you cannot add more data definitions to it.
4. Click **Finish**.

   The project tree displays the new object under eBAM Queries, and the Component Editor opens a query-editing canvas that displays the data definition(s) on the left side of the canvas and an empty dataset view on the right side. See Figure 36.

**Figure 36** Component Editor, Showing Newly Created (Unconfigured) Query



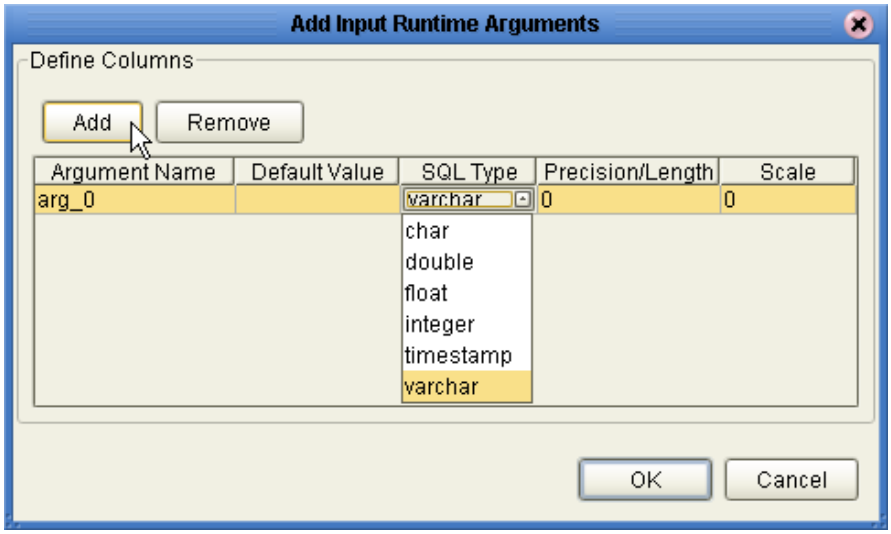

**Note:** *The tool palette for the query-editing canvas is mostly the same as for the Condition Editor.* **Table 10 on page 61** *explains the graphical controls, and* **Figure 44 on page 62** *lists the SQL operators. In Figure 36, the cursor points at the additional tool in the palette,* ***Add/Edit Runtime Inputs****; this tool is explained in detail in the following procedure.*

### To add or modify runtime inputs to a configured query

The Add/Edit Runtime Inputs tool allows the eBAM application to accept input at run time. In SQL terms, this tool allows you to make variables accessible to your WHERE clauses. Conditions are met or unmet -depending on the data values at run time.

1. In the Component Editor, with the query-editing canvas active (see **Figure 36 on page 55**), on the toolbar palette, click the **Add/Edit Runtime Inputs** tool.
2. In the Add Input Runtime Arguments dialog box (see Figure 37), click **Add** as many times as needed to create additional runtime arguments.

**Figure 37** Adding Input Runtime Arguments to eBAM Queries




3 Double-click each argument name and modify it appropriately.

**Note:** *Do not use field names that match SQL reserved words, irrespective of uppercase, lowercase, or mixed case. See* **"SQL Reserved Words" on page 169**.

4 As needed, change each argument's SQL type from varchar to one of the following: char, double, float, integer, or timestamp.

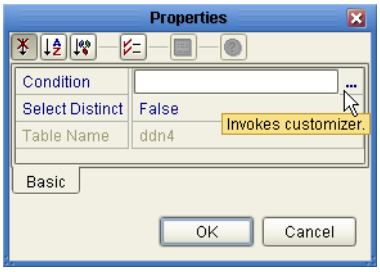
5 As needed, set default values for arguments.

6 When finished, click **OK**.

### To use runtime arguments in the Condition Editor

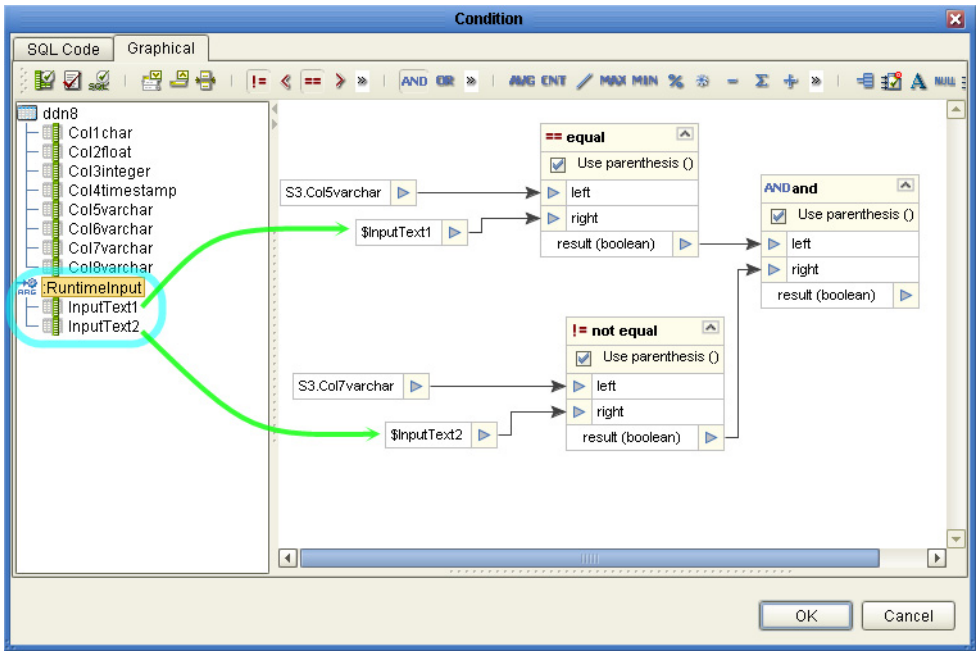
1 In the Component Editor, with the query-editing canvas active, right-click a data definition and click menu item **Properties**. In the Properties dialog, click **Condition**, and then click the ellipsis [...] to open the Condition editor. See Figure 38.

**Figure 38** Configuring a Condition



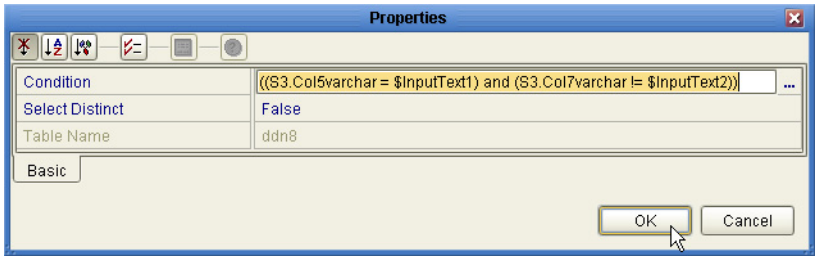

2 For general conditions, see **"Using the Condition Editor" on page 60**. If you defined input runtime arguments (see previous procedure), their fields are also available to you, on the left side of the Condition editor. For a query to make use of the runtime input, one or more of the conditions must involve a runtime argument. See Figure 39.

**Figure 39** Configuring a Data Definition Condition Using Runtime Arguments




3 When finished, click OK. Then, inspect the resulting SQL string displayed in the Properties dialog box (see Figure 40). When you are satisfied with it, click **OK**.

**Figure 40** SQL String in Properties Dialog Box

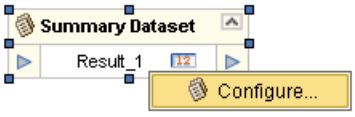



The condition is created, and for each column in the data definition involved in the condition, a small red "filter" icon appears to the right of the column name.

**To configure the dataset, mapping operators and data definition fields to its fields**

1 In the Component Editor's query-editing canvas, right-click the dataset object and, on the pop-up context menu, click: **Configure** (see Figure 41).

**Figure 41** Configuring the Dataset




2 In the **Configure Dataset View** dialog, click **Add** as many times as needed to accommodate all the columns you will need. (For General queries, you can only

add columns; for Summary queries, you can only add columns of type Value; and for Category queries, you can only add columns of type Series.)

3 Double-click each field, edit the name, and press ENTER. When finished, click **OK**.

**Note:** *Do not use field names that match SQL reserved words, irrespective of uppercase, lowercase, or mixed case. See* **"SQL Reserved Words" on page 169**.

4 In the query-editing canvas, construct what you want to appear in the dataset view:

- Drag operators as needed from the operator palette (see **Figure 44 on page 62**) into the canvas.
- Using as your input fields from data definitions (and from runtime arguments, if present), modify and/or combine them via operators as needed, with all output ultimately going into the dataset view.

For examples of this, see **Figure 42 on page 59**, or see **Figure 59 on page 88**.

**Note:** *Data type conversions are done automatically where needed; for timestamps converted to varchar, permit truncation to occur.*

### To configure Group-By and Order-By characteristics of the entire query

**Note:** *Summary queries cannot have Group-By or Order-By characteristics. Category queries are always grouped first by the Category column and then by each Series column, and therefore cannot have additional Group-By characteristics.*

1 In the Component Editor's query-editing canvas, as needed, drag in a Group-By and an Order-By from the tool palette.

2 If you want to establish subordinate groupings or orderings (as opposed to a single grouping/ordering or multiple independent groupings/orderings), right-click the Group-By or Order-By and click **Add** as many times as needed.

3 In the query-editing canvas, construct what you want to appear in the DatasetView:

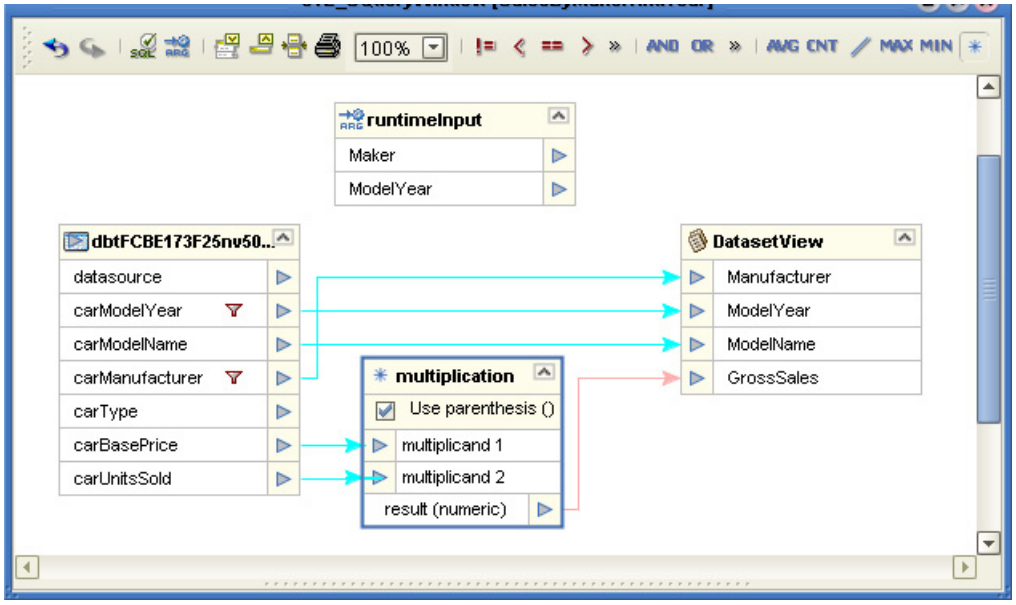
- Drag operators as needed from the operator palette (see **Figure 44 on page 62**) into the canvas.
- Using as your input fields from data definitions (and from runtime arguments, if present), modify and/or combine them via operators as needed, and map the output into an unused entry in a Group-By or Order-By. (The same output can be used in multiple Group-By and/or Order-By entries.)

4 If you want to reverse-sort any Order-By, right-click it and choose **Switch Order Direction**.

## Example of an eBAM Query Using a Runtime Argument

The sample implementation discussed in **Chapter 8** uses a simple stored query with a runtime input argument. Another example is shown in Figure 42.

**Figure 42** Example of a Well-Configured eBAM Query




This query takes a seven-field data definition and sets up a filtering condition using two of those fields (carManufacturer and carModelYear), using the runtime input arguments (Maker and ModelYear). The filtering condition is: *If carManufacturer matches the runtime input value supplied for Maker and, at the same time, carModelYear matches runtime input value supplied for ModelYear, then perform the mapping.*

When the query is executed, its output will have four fields: The first three will simply echo the make, model, and year of the data matching the conditions, and the fourth will be a computed KPI ("GrossSales") that reports the product of BasePrice and UnitsSold.

- The input file (TestQueryIn.*) provided with the sample looks like this:

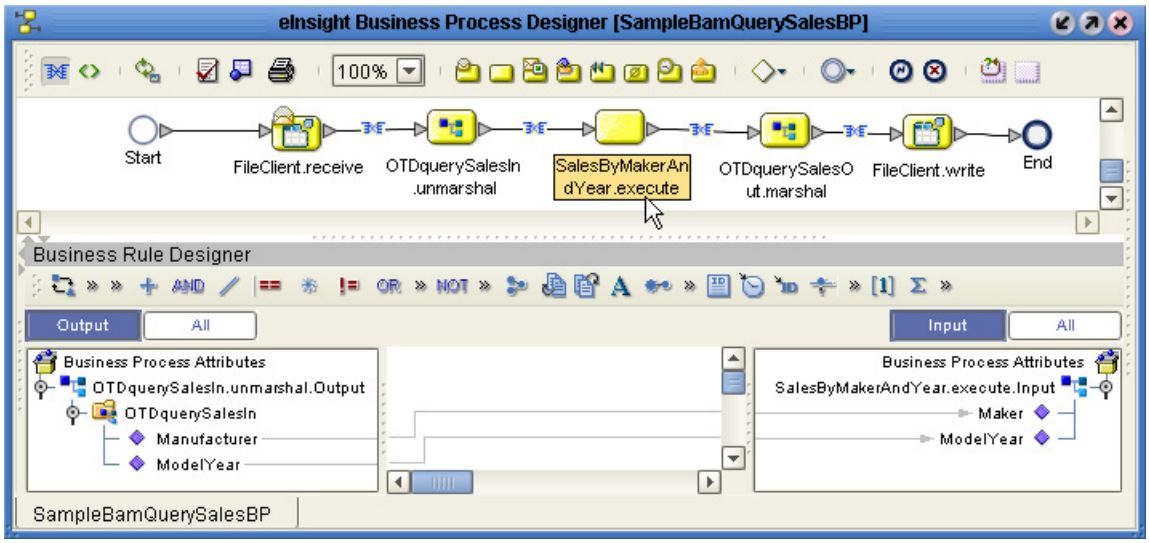
```
Ford,2003
```

- The output file (TestQueryOut.*), which shows per-model gross sales figures, might look like this when the input arguments are "Ford,2003":

```
Ford,2003,Crown Victoria,27260750.0
Ford,2003,Escape,12891190.0
Ford,2003,Excursion,43284780.0
Ford,2003,Expedition,28638000.0
```

Runtime arguments used in a query communicate by implementing the query's **execute** in a business process, as illustrated in Figure 43, and also demonstrated in the sample by business process **bpQryExtractSalesByCarNames**.

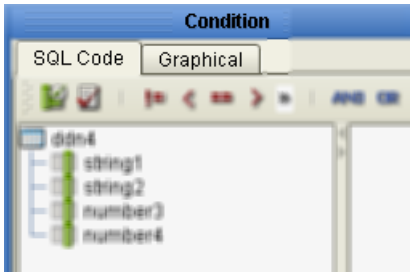
**Figure 43** Implementing an eBAM Query in a Business Process




## 5.3 Using the Condition Editor

The Condition editor constructs filters that constitute conditions on the data definition. Although you can type in (or use CTRL+V to paste) native SQL in text form, the editor offers features that help SQL-adept users avoid making mistakes, while allowing other users with less SQL knowledge to construct statements by purely graphical means.

In the Condition editor, you can switch at will both between the two user modes (SQL Code and Graphical).




- The **SQL Code** canvas allows you to enter native SQL commands and/or to drag elements or operators from the trees on the left.
- The **Graphical** canvas allows you to create conditions simply by dragging elements and operators from the trees on the left. Its tool palette provides several tools, listed in Table 9:

**Table 9** Tools Provided in the Graphical Canvas of the Condition Editor

| | |
|---|---|
|  | Show Table Tree allows you to display or hide the left pane, where available runtime arguments and data definition columns are displayed. |

**Table 9** Tools Provided in the Graphical Canvas of the Condition Editor (Continued)

| | |
|---|---|
|  | **Validate** checks the syntactical validity of the graph and, in the Output pane, reports success or any errors found, highlighting all operators that are unsatisfied. |
|  | **Show SQL for Condition** tries to validate the graph and, if successful, displays the corresponding SQL statement for the entire condition. |
|  | **Expand All Graph Icons** provides more detail, by showing all input to (and output from) all fields in all operators on the canvas. |
|  | **Collapse All Graph Icons** provides more screen space by minimizing all operators, showing only the connections to and from them. |
|  | **Autolayout All Graph Icons** disentangles crossed connections and overlaps, and creates left-to-right flow of input to output. |

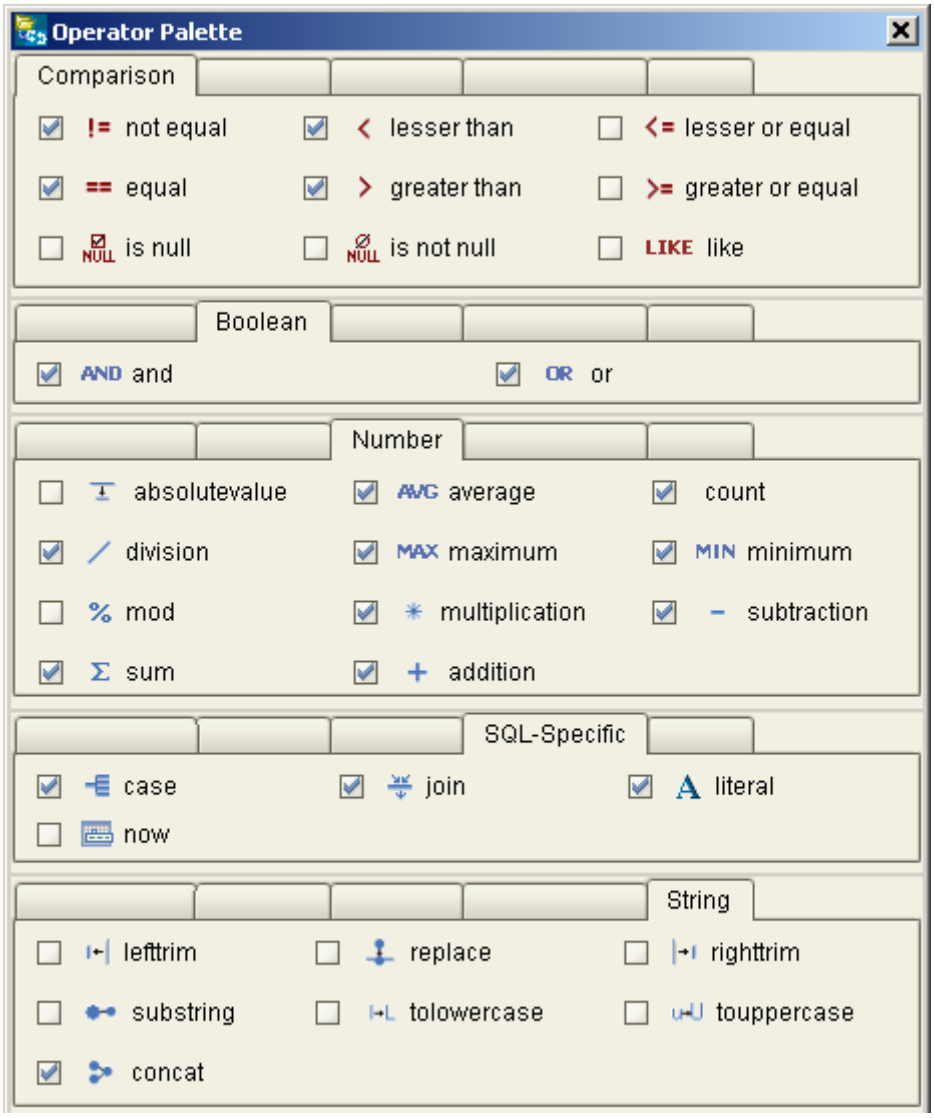
When a data definition column or runtime argument has a condition placed on it, the query-editing canvas displays a small red funnel (filter) to the right of its name.

Optionally, you may want to click **Show SQL** occasionally to see SQL statements you are creating graphically, or use other graphical design tools listed in Table 10.

**Table 10** Tools Provided in the Tool Palette of the Query-Editing Canvas

| | |
|---|---|
|   | **Undo** and **Redo** allow you travel backward and forward through the sequence of modifications you have made to the graphical canvas. |
|  | **Print Graph** allows you to print the graph, using various scaling options. |

**Figure 44** Operator Palette for SQL Operations



Chapter 6

# Using eBAM Alerts

eBAM applications use alerts to deliver a notification when a particular condition is met by a query, and background information is provided to help you better understand the alerts and their conditions. Step-by-step instructions lead you through the processes for creating, configuring, and using alerts in eBAM applications. These procedures assume you are already familiar with Enterprise Designer and such eBAM concepts as data definitions and queries.

**What's in This Chapter**



## 6.1 eBAM Alerts

Alerts provide an easy way for eBAM to automatically transmit data on a periodic basis. You can transmit any data you want.

- For example, you might transmit a predetermined text string along with a computed value and the current date and time: "As of *date*, total sales are *value*" (this is an example of a query that does not rely on a condition).
- More typically, you might transmit data only when a certain condition has been satisfied or a threshold has been reached: "The following dealers are currently underperforming defined as below 75% of quota: *(followed by a list)*."

Each eBAM alert is based on an eBAM query (for complete information on queries, see **"Using eBAM Queries" on page 53**). The purpose of an alert is to provide periodic notification, often only when a particular condition is met by the query. This notification can take the form of an email, or it can trigger an eInsight business process and provide data to it via the notify web service. Alert conditions have the following characteristics:

- *(required)* A name and an associated query.
- *(required)* Values for timing properties: Notification Interval and Resend Frequency.
- *(required only for email alerts)* Values for email properties, such as mailserver name.
- *(depending on the associated query)* At least one key field that is valuated in the dataset of the query.

## 6.1.1 What You Need to Know About Alerts

The two foundations of an alert are its query and its properties. The query determines the data to be transmitted. The properties determine how often the alert notification is sent, and in what form.

Alert notifications are sent out repeatedly, and continue to be sent whenever the eBAM data store contains data satisfying the alert criteria. The eBAM database contains a separate table that keeps a record of all alert notifications that have been sent.

Constructing an alert requires three considerations:

- **Notification Interval -** This determines how often the alert query is executed.
- **Resend Frequency -** This determines how often to re-send an alert notification that was previously sent.
- **Query to be used -** This determines the data to be sent, as well as any conditions used to filter the data.

### Example of an Alert

Here is a simple alert showing the three considerations:

- *Notification Interval* - 5 minutes
- *Resend Frequency* - 30 minutes
- *Query1* - "SELECT column1, column2 WHERE column3 < 45"

Every 5 minutes (the Notification Interval), *Query1* is executed against the current data in the eBAM table, and data satisfying the query criteria is placed into a temporary queue. In this example, if the value in column3 is less than 45, then the values in column1 and column2 are placed into the temporary queue.

In the temporary queue, a comparison is made, using the key values as unique identifiers, to determine whether the new data matches an alert notification that was previously generated and sent:

- If a match is ***not*** found against a previous alert, then a new alert notification is sent out without delay.
- If a match ***is*** found, then Resend Frequency comes into play: The time of the most recent alert notification is subtracted from the current time to determine whether it should be resent. In this example, if more than 30 minutes have elapsed, the alert notification is sent out again. Otherwise, after the next Notification Interval has passed, the query is executed again. If the same record appears, it is again compared to the last sent value to determine if it should be resent. This is repeated until 30 minutes have elapsed since the previous one was sent out, at which point the alert is resent, and the last sent value is reset to the current time.

## 6.1.2 Queries: Conditions and Output Data

All eBAM queries are SQL Select statements. The general form of a Select statement is:

SELECT *columnA*[, *columnB*[, ...]] FROM *tableX* [WHERE *(condition statement)*]

When you use the Query Editor, you specify the column or columns and eBAM automatically provides the FROM clause. To create a WHERE clause (if you want one), you must use the Condition Editor to create the condition statement.

Note:

- The WHERE clause, if present, filters the candidate data.
- The SELECT clause specifies the actual output data.

## 6.1.3 Things to Keep in Mind

The following guidelines can be helpful when you construct an alert:

- An eBAM application can contain many alerts, or only one, or none at all.
- Each alert is based upon exactly one eBAM query. An eBAM query can be used by many alerts, or only one, or none.
- Although any query type can be used, General and Category are the only useful types of query for alerts.
- Alert notifications can only send data selected from the columns in a single query. It is not possible to concatenate queries; in other words, you cannot use the results of a WHERE clause to start a subsequent and separate SELECT statement.
- The query used by an alert need not contain a condition. If the query does contain a condition (in other words, if the query's SQL statement contains a WHERE clause), then the data transmitted is from the columns of the SQL statement.
- The WHERE clause is *not* a trigger; its purpose is to filter down the candidates of data to be transmitted. Triggering of query execution (and the operation of the alert notification) is controlled by the Notification Interval.
- After an alert has been created, the only way to completely disable it is to stop or undeploy the eBAM application, or delete the alert completely and redeploy. Even with an extremely large Resend Value, such as one year, the query is still executed at least once upon startup of the eBAM application. Thus, the query is executed whenever the application is redeployed to a running Domain, or upon restarting a Domain where the application is deployed.

### A Negative Example

This is an example of a plausible alert that you *cannot* create using eBAM:

- CarModel is a variable, and several different models might conceivably exceed $10,000,000 in total sales.
- The condition you want to test is this: For a particular model, CarModelX, does the sum of all sales across all CarDealers exceed $10,000,000?
- The data you want to transmit is this: A list of all CarDealers that have recorded sales of CarModelX.

The reason this alert cannot be created is that it would require two separate queries to be executed: One query to return a list of all car models whose total sales exceeded $10,000,000; another query to determine, from the results of the first, which dealers had sold a particular model. This is impermissible, because it would require one query to be embedded inside the WHERE clause of the main SELECT statement. Although such nested SELECT statements are permitted in some SQL implementations, such as Oracle's, they are not supported by eBAM.

## 6.2 Setting Up the Application's Alert Conditions

eBAM allows you to set up tests whereby an alert notification is sent (and repeated with a specified frequency) whenever a condition is met. The condition can be as simple as a particular data item exceeding a threshold, or it might be a complex comparison between ratios of many aggregates of data items.

For each alert condition you create or configure, consider the following:

- *What to communicate:* One or more fields in the query's dataset that are valuated (that is, that have mappings to them from operators and data definition fields; see **"To configure the dataset, mapping operators and data definition fields to its fields" on page 57**.
- *How to communicate:* Settings for the alert as a whole, such as resend frequency (see below) or email properties (see **"To set up email notification that an alert condition has been met" on page 67**).

### To create and configure an alert condition

1. In the project tree, under the eBAM application, right-click **Alert Conditions** and, on the popup context menu, click: **New Alert Condition**

   The eBAM Component Editor creates an alert based on the last-edited query.
2. Choose the correct query from the drop-down list. The Edit button to the right of the list allows you to enter the Query Editor.
3. If appropriate, select or clear check boxes constituting the key(s) for the alert.

   The key, or a set of keys, is used to prevent duplication. When a record is found that matches the condition, the alert is *not* sent if any of its specified keys has a match in a record that was already staged. In other words: If a duplicate key is found, then the alert remains unsent until the alert's Resend Frequency is exceeded.
4. In the Properties pane, Alert tab, set Notification Interval and Resend Frequency to appropriate values:
   - Notification Interval specifies how often to run the process.
   - Resend Frequency specifies how often to re-issue a previously sent alert.
5. If you do ***not*** want e-mail sent, you are done. If, instead, you do want to set up automatic e-mail notification whenever an alert condition has been met, continue with the following procedure.

### To set up email notification that an alert condition has been met

1. In the eBAM Component Editor, in the Properties pane, click the **Email** tab.
2. Supply values appropriate for your site, yourself, and this alert (see Table 11).

**Table 11** Alert Properties for eMail

| Name | Default Value | Comment |
|---|---|---|
| Send Email | False | To arrange for e-mail messages to be sent, change this to **True**. The value **False** causes all other properties to be ignored. |
| SMTP Server Host | (blank) | The hostname or IP address of the SMTP server at your site. (SMTP = simple mail transfer protocol).<br>Hostname is case-insensitive; domain is optional. Thus, all the following examples are valid:<br>▪ mySmtpServer<br>▪ mysmtpserver<br>▪ mysmtpserver.mydomain.com<br>▪ 10.18.133.200 |
| SMTP Server Port | 25 | The port number that this machine uses for email. |
| Username | (blank) | The login ID of a user who is authorized to send email on this SMTP server. Required only if the SMTP server requires authentication. If provided, eBAM will try to authenticate. |
| Password | ******** | The password for this user on this SMTP server. All text entered in this field is masked as a row of asterisks (**********). |
| Send From | (blank) | The e-mail address of the message originator; can be blank. Case-insensitive, but preserves the case as entered.<br>For internal email, either of the following forms is valid:<br>▪ myname<br>▪ myname@mydomain.com<br>For external email, a domain must be specified; in other words:<br>▪ myname@mydomain.com |
| Send To | (blank) | The email address of the message recipient(s). If sending to more than one recipient, separate e-mail addresses by commas. Case-insensitive, but preserves the case as entered. |
| Message | (blank) | The text of the message to be sent.<br>For easier viewing and editing, click the ellipsis [...] to the far right of this field. |

3. When you have finished configuring the alert properties, audition your email message's appearance by clicking the Preview tab's **Refresh alert message** button.

Chapter 7

# Using eBAM Charts

eBAM uses charts that provide real-time feedback. "Using eBAM Charts" provides information on these charts along with step-by-step instructions for creating, modifying, and previewing them. Because the instructions assume you are already familiar with eGate GUIs, they focus on the concepts and design-time GUI operations that are specific to eBAM.

**What's in This Chapter**



## 7.1 eBAM Charts

eBAM charts provide real-time feedback on the current data set according to conditions you set up. Charts are based on queries; a query can be used by many charts, but each chart is based on exactly one query. (For cosmplete information on queries, see **"Using eBAM Queries" on page 53**.) The purpose of a chart is to display easy-to-grasp visual information about a body of data or its statistics and key performance indicators (KPIs). The datastream and facts-of-interest are determined by the query; the presentation is determined by the chart parameters.

### About Charts

Charts are graphical representations of KPIs. An eBAM application can contain many charts, or only one, or none at all. All eBAM charts have the following characteristics:

- A name, an associated Summary or Category query, and a *chart type*: bar, pie, meter, or trafficlight.
- Properties set in the **Common** tab, such as alignment, font, and update frequency. For details, see Table 21.
- *(except for meters)* Properties set in the **Chart** tab, such as 3D appearance, chart orientation, and navigation controls. For details, see Table 22.
- Properties specific to the chart type. For details, see Table 23 (Pie), Table 24 (Bar), Table 25 (Meters), and Table 26 (Trafficlights).

# 7.2 Setting Up the Application's Charts

### To create and configure a chart

1. In the project tree, under the eBAM application, right-click **Charts** and, on the popup context menu, click: **New Chart**.

   The eBAM Component Editor creates an chart based on the last-edited query.

2. If appropriate, choose the correct query from the drop-down list. The Edit button to the right of the list allows you to edit the query.
3. For Chart Type, choose from the drop-down list: Pie, Bar, Meter (available only if the query is a Summary), or Light.
4. If you committed preview data when you validated the data definition(s), click the **Refresh Chart** button to audition the chart's appearance.
5. In the Properties tabs, adjust parameters appropriately. With the Preview tab selected, you can:
   - Use the **Refresh** button to update the preview any time you make a change to the chart properties.
   - Use the **Print** button to print a hardcopy of the previewed chart.

Chapter 8

# Sample and Tutorial

To help you understand eBAM Studio and its capabilities, Sun provides a tutorial which instructs you on installing and then running a sample Project and the files supplied with the product. The step-by-step instructions are followed by a hands-on explanation of how to re-create and modify the sample on your own. The instructions assume you have installed the File eWay, which the sample implementation uses for input/output of sample data.

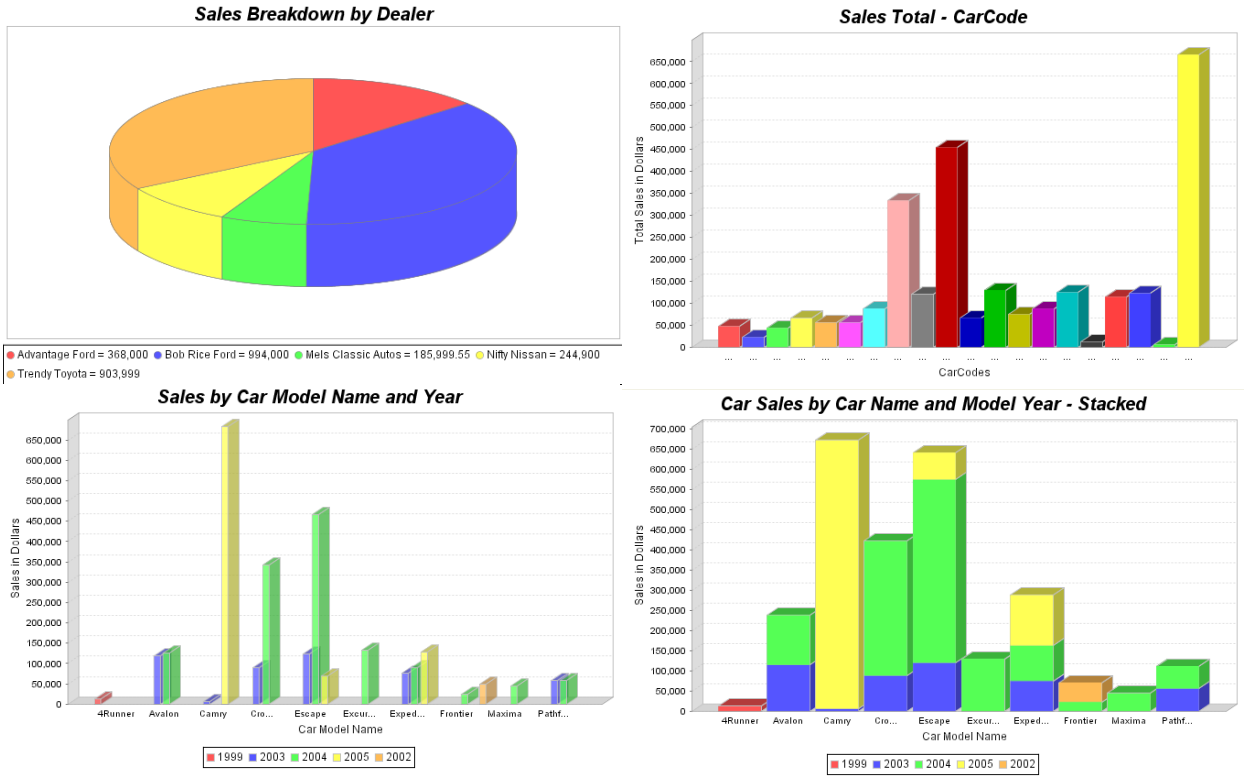
### What's in This Chapter



## Last Things First

When you finish studying the tutorial and running the sample, you will have installed, deployed, run, and monitored the sample eBAM application supplied in **eBAMDocs.sar**. Upon feeding in sample data, results will include the following: One pie chart and three bar charts as shown in Figure 45, with the display updating every 30 seconds; an output alert file that is written out to a file whenever a particular threshold is reached; and an output results file generated by a dynamic query whose target varies according to the contents of a file you feed in.

**Figure 45** Charts Displayed for Sample




## Roadmap: Sample, Tutorial, or Both?

The eBAM Studio product includes a complete sample implementation, included in the **eBAMDocs.sar** file, that allows you to see the end results without having to go through all the design steps; it allows you to see runtime results quickly, but does not instruct.

The tutorial, on the other hand, provides a detailed hands-on guide to creating all the sample components, including ones that are not specific to eBAM. Many procedures in preceding chapters of this book are recapitulated using concrete examples.

Table 12 compares the goals and tasks of the two approaches.

**Table 12** Comparing the Sample to the Tutorial

| | Purpose | Tasks |
|---|---|---|
| Sample 8.1 on page 72 | "Load and go": Provides the quickest route to seeing an eBAM application in action. | Install the sample; import the project; create the deployment profile and build/deploy the project; view initial results; experiment with feeding modified data. |
| Tutorial 8.2 on page 75 | "Up close and detailed": Provides complete steps for creating and configuring the working eBAM application provided in the sample. | Create the environment and project; add and configure all components that will be used (OTDs, eBAM components, business processes, and a Connectivity Map), build/deploy the project; view initial results; experiment with feeding modified data. |

If you do both the sample and the tutorial, do the sample first; this allows you to use it as reference material and backup when you go through the tutorial.

# 8.1 Quick Start: Installing and Running the eBAM Sample

This section contains procedures for installing and running the eBAM sample, omitting all design-time steps. It assumes your installation runs entirely on a Windows machine referred to as "localhost" that uses defaults for all ports and configuration parameters, that all usernames and passwords are "Administrator" and "STC," and that you have a Sun SeeBeyond Integration Server that is already running a Domain called "domain1." (For instructions on starting domain1, see **"Starting the Domain to Run the Sample" on page 111**. For instructions on deployment to Sun Java Application Server for viewing web applications on a Sun Java Portal Server, see **Chapter 9 "Using eBAM Charts in Portals" on page 117**.)

**Setup procedures**

- **"Installing the Sample Files" on page 72**
- **"Importing the Sample Project" on page 73**

**Activation procedures**

- **"Building, Deploying, and Monitoring the Project" on page 111**

**Runtime procedures**

- **"Monitoring Key Performance Indicators with Live Data" on page 114**

## 8.1.1 Installing the Sample Files

These steps assume you will install the sample files to a temporary eBAM directory named **C:\temp\eBAM** whose **Workspace** subdirectory will be used by eBAM.

**To install the sample files**

*Before you begin:* Your repository must already be running, and you must be logged in to Enterprise Designer. If you have already uploaded the documentation for eBAM, you can skip steps 1 through 4 and start with step 5.

1. In the **Administration** tab, click the text link "Click to install additional products."
2. In the **Product List** page, select the following if not uploaded previously:
   - Under eWay: **FileeWay**
   - Under Documentation: **eBAMDocs**

   After you have finished making these selections, and any others, click **Next**.

**Note:** *eBAMDocs.sar contains documentation and sample files. The File eWay is used in the sample implementation to read data from the files and write output.*

3 In the **Select >> Upload** page (Selecting Files to Install): Browse to the location of **eBAMDocs.sar**, select it, and click **Next**; repeat as needed for other product files.

4 When the **Select >> Upload >> Install** page signals, "Installation finished," click the **Documentation** tab.

5 In the Documentation tab, click **Core Products**, and then click **eBAM Studio**.

6 In the right pane, click the icon to the right of **Sample Projects**.

7 Preserving file paths, extract the files to your C:\temp\eBAM directory.

The following directories and files are created:

```
C:\temp\eBAM\Sample\Projects\SampleBamProject.zip
C:\temp\eBAM\Sample\Data\In\input*_original.~in
C:\temp\eBAM\Sample\Data\In\TriggerDelete_original.~in
C:\temp\eBAM\Sample\Data\Out\outputAlert_comparison.dat
```

## 8.1.2 Importing the Sample Project

### To import and validate the sample project

*Before you begin:* Your repository must already be running, and you must be logged in to Enterprise Designer.

1 In Project Explorer, right-click the repository and, on the pop-up context menu, click **Import**, and then click **Yes** to continue.

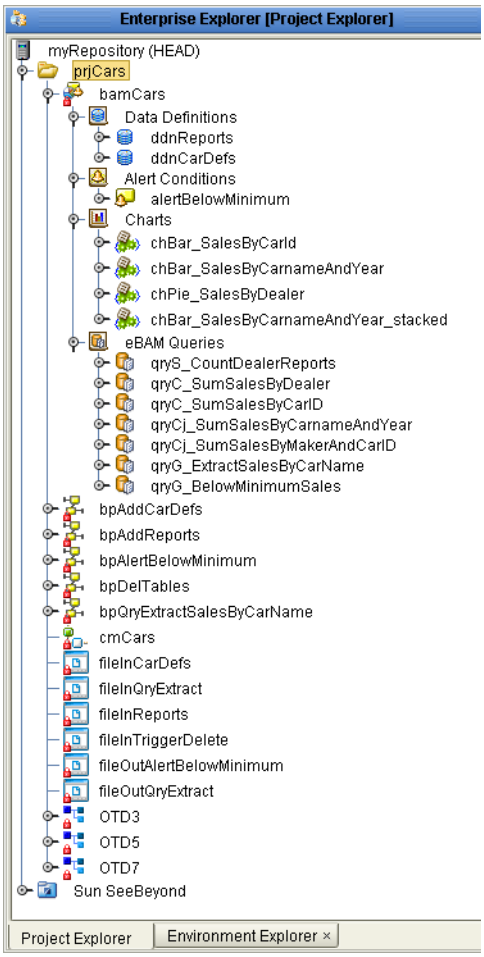
2 In the **Import Manager** dialog, browse to C:\temp\eBAM\Sample\Projects, select **SampleBamProject.zip**, and click **Open**.

3 Back in the **Import Manager** dialog, click **Import**. If a warning is displayed about APIs missing from the target Repository, ignore it and continue.

4 When the import ends successfully, click **OK**, and then click **Close**.

The sample project is now visible in the Project Explorer tree. See Figure 46.

**Figure 46** Sample Project prjCars, Showing Components in Project Tree




5 In Environment Explorer, check out envBam and supply the password for isEbam. (If needed, adjust other settings as well; for example, in a UNIX environment, edit the parameter settings "C:\temp\..." in the properties of extFileBam and isEbam.)

6 In Project Explorer, under prjCars, check out bamCars. Then, open each of its two data definitions and validate them by previewing and committing the sample data supplied; for instructions, see **procedure on page 80**.

7 Open each of the four charts and preview them; see step 4 in **procedure on page 93**.

8 Create a deployment profile named **dpCars** (referencing cmCars and envBam), automap the components, build the project, and deploy the resulting .ear file (named prjCars**dpCars.ear**); for instructions, see **procedure on page 112**.

9 After the project is built and deployed, point your browser at the URL for monitoring the eBAM charts for this project:

```
http://localhost:18001/prjCarscmCarsbamCars1dpCars/
```

If your integration server is running on another machine, or if it does not use port 18001 for HTTP, then substitute the correct machine name and port in the URL.

10 See how the charts change as you feed in data; for instructions, see **procedure on page 113**.

# 8.2 Hands-on Steps for Designing an eBAM Application

This section provides steps for:

- **"Starting Up" on page 75**, where you set up the environment, named envBam, and project, named prjCars.
- **"Creating and Validating the OTDs" on page 77**, where you use create three simple OTDs: OTD7, OTD5, and OTD3, containing seven, five, and three fields.
- **"Creating the eBAM Application and Data Definitions" on page 79**, where you create the eBAM application, named bamCars, and two data definitions: ddnCarDefs (seven fields), and ddnReports (five fields).
- **"Creating the eBAM Sample Queries" on page 82**, where you set up the queries that will be used to manipulate the datastream (for use in charts) and identify conditions where the datastream crosses a threshold (for use in alerts).
- **"Creating the eBAM Sample Alert" on page 91**, where you set up an alert to issue a notification when a condition is met.
- **"Creating the eBAM Sample Charts" on page 93**, where you set up and preview charts to graphically display current data values and KPIs.
- **"Creating and Validating the Business Processes" on page 100**, where you create four business processes (bpAddCarDefs, bpAddReports, bpDelTables, bpAlertBelowMinimum), link web services and OTD methods, and define the business rules between them.
- **"Creating and Configuring the Connectivity Map" on page 107**, where you use the Enterprise Designer's Connectivity Map Editor to connect instances of project components and to configure parameters for inbound and outbound File eWays.
- **"Starting the Domain to Run the Sample" on page 111**, where you start the server and activate the domain where you will deploy your completed project.
- **"Building, Deploying, and Monitoring the Project" on page 111**, where you use Enterprise Designer to create a deployment profile and build/deploy the project.

After the application is running, use the same runtime procedures as for Sample:

- **"Monitoring Key Performance Indicators with Live Data" on page 114**, where you feed data to the logical host and use the Charts Viewer to monitor results.

## 8.2.1 Starting Up

Follow these procedures to get started with a blank canvas for your design work.

### To re-create the sample environment

*Before you begin:* If necessary, start the repository server and start Enterprise Designer. If you already installed the sample project, rename it to: **prjCars(old)**. If you already installed the environment for the sample project, rename it to: **envBam(old)**.

These steps assume you will use a default integration server running on default ports. If you use anything other than a SeeBeyond Integration Server on ports 18000–18009, make adjustments in step 5 below or in the URL in step 9 in the **procedure on page 74**.

1. In Enterprise Designer, click the **Environment Explorer** tab.
2. In the environment tree, right-click the repository and, on the pop-up context menu, click **New Environment**
   - Right-click the newly created environment and rename it to: **envBam**
3. Right-click envBam and, on the pop-up menu, point at **New** and then click **File External System**.
   A. Name the new external **extFileBam** and click **OK**.
   B. Right-click extFileBam, open its properties, and configure it as follows:
      - Inbound File eWay > Parameter Settings > Directory: **C:\temp\eBAM\Sample\Data\In**
      - Outbound File eWay > Parameter Settings > Directory: **C:\temp\eBAM\Sample\Data\Out**
4. Right-click envBam and click: **New > Logical Host**
   - Right-click the newly created Logical Host and rename it to: **lhEbam**
5. Right-click lhEbam and click: **New > SeeBeyond Integration Server**
   A. Right-click the newly created Integration Server and rename it to: **isEbam**
   B. Right-click **isEbam**, open its properties, and configure it as follows:
      - Application Workspace Directory: **C:\temp\eBAM\Workspace**
      - Username and password: (If not "Administrator" and "STC," enter the values that have been created by your system administrator.)

   You have re-created the sample environment provided in the sample. It contains all servers that are needed, and all required server configuration steps have been taken. You can add or modify parameter settings to tailor them appropriately for your ne(such as

### To re-create the sample eBAM project container

1. In Enterprise Designer, click the **Project Explorer** tab.
2. In the project tree, right-click the repository and, on the pop-up menu, click **New Project**. Rename the new project to: **prjCars**.

## 8.2.2 Creating and Validating the OTDs

This procedure helps you get acquainted with the sample OTDs listed in Table 13 by taking you through steps for creating and testing them.

**Table 13** OTDs Included With the eBAM Sample

| Name | Purpose | Sample Data to Test |
|---|---|---|
| OTD7 | In the bpAddCarDefs BP, this OTD unmarshals data (seven fields per record) so that it can be added to the ddnCarDefs data definition. | ...\Sample\Data\In**inputCarDefs*.txt**<br>Seven fields per record: car ID number; model name; manufacturer; car type; car size; model year; and base price. |
| OTD5 | In the bpAddReports BP, this OTD unmarshals data (five fields per record) so that it can be added to the ddnReports data definition. Additionally, in the bpAlertBelowMinimum BP, this OTD marshals data so that it can be written to a file. | ...\Sample\Data\In**inputReports*.txt.**<br>Five fields per record: dealername; car code letter; car ID number; saleprice; and time-of-sale |
| OTD3 | In the bpQryExtractSalesByCarName BP, this OTD marshals data (threee fields per record) so that it can be written to a file. | (not applicable) |

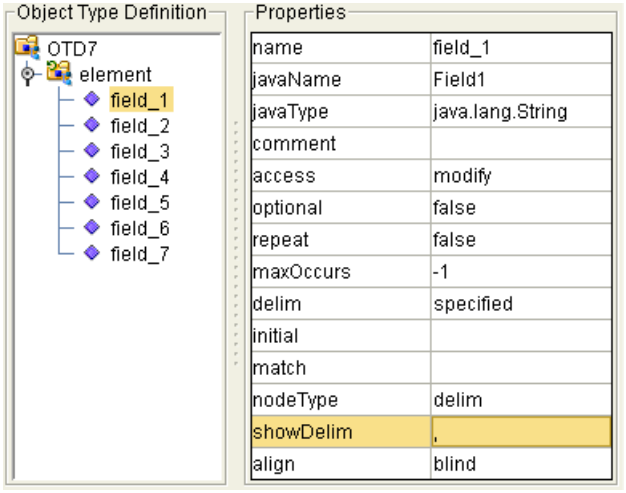
**To create the sample eBAM OTDs**

1. In the project tree, right-click prjCars and, on the pop-up menu, point at **New** and click **Object Type Definition**.

   The New [OTD] Wizard appears.

2. In step 1 (Select Wizard Type): Click **User-Defined OTD** and click **Next**.
3. In step 2 (Enter OTD Name): Type **OTD7** and click **Finish**.
4. In the OTD Editor: In the center pane, click **OTD7**; then, in its Properties pane, click **delim**. Create two new levels of delimiters: Add **\r\n** (return+linefeed) as a normal level-one delimiter, and then add**,** (comma) as a normal level-two delimiter.
5. Right-click OTD7 and create an element under it. Select **element** and change its **repeat** property to **true**.
6. Under **element**, create eight fields (through **field_7**). Finally, delete the first field (see Figure 47).

**Figure 47** Seven-Field Sample OTD (OTD7)




7 Repeat steps 1 through 6 to create a three-field OTD named **OTD3**, containing one \r\n-delimited repeating element as above, but with three comma-delimited fields.

8 Repeat steps 1 through 6 to create a five-field OTD named **OTD5**, containing one \r\n-delimited repeating element as above, but with five comma-delimited fields.

### To validate the sample OTDs

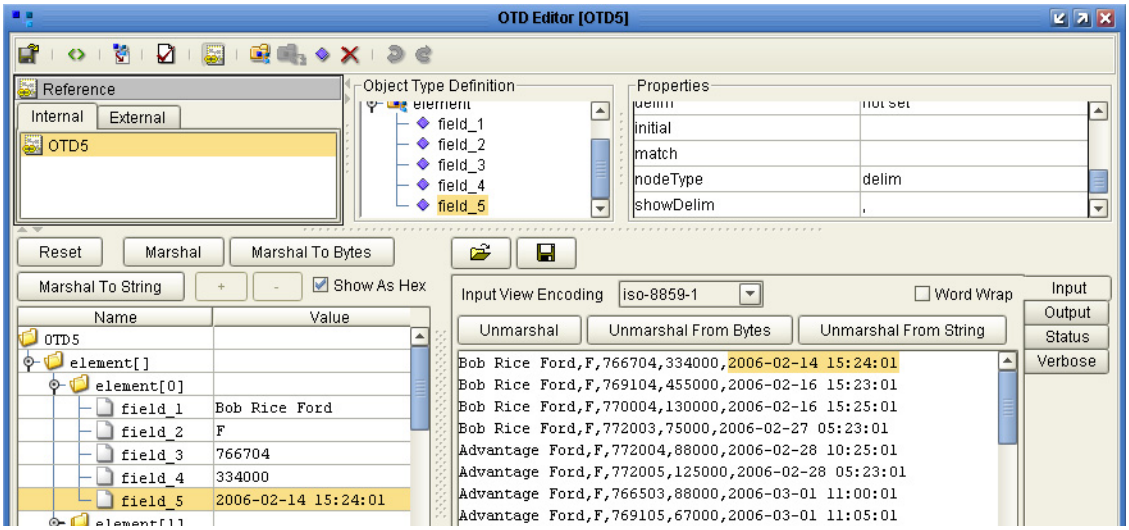
1 In the toolbar of the OTD Editor, click **Run Test** to open the OTD Tester pane.

2 In the toolbar of the OTD Tester, with the **Input** side tab selected, click **Open File**.

3 In the Open dialog, browse to the location (C:\temp\eBAM\Sample\Data\In) of the file containing the sample data for this OTD (see Table 13) and open the file.

4 After successful unmarshaling, open the tree in the left pane of the OTD tester to see how the sample data was parsed. See Figure 48.

**Figure 48** Validation of OTD5 Using Data From inputReports5_original.~in



## 8.2.3 Creating the eBAM Application and Data Definitions

The procedures in this section explain how to create and configure the data definitions used in the eBAM sample. The field names and data types you will use for the fields are shown in Table 14 and Table 15.

**Table 14** Metadata (Field Names and Data Types) for ddnCarDefs

| Name | Type | Meaning |
|---|---|---|
| carCode | integer | Six-digit ID, such as “886503” or “611104”. |
| carName | varchar | Model name, such as “Excursion” or “Camry”. |
| carMaker | varchar | Manufacturer, such as “Ford” or “Toyota”. |
| carType | varchar | Type of car, such as “luxury”, “SUV”, “truck”, or “car”. |
| carSize | char | Single letter: “S”, “M”, or “L”. |
| carModelYear | integer | Model year, such as “2004” or “2006”. |
| carSugBasePrice | float | Base price, such as “36775.00” or “19045.”. |
| To validate **ddnCarDefs**, use sample data file C:\temp\eBAM\Sample\Data\In**inputCarDefs**7* | | |

**Table 15** Metadata (Field Names and Data Types) for ddnReports

| Name | Type | Meaning |
|---|---|---|
| dealerName | varchar | Dealer name, such as “Springfield Ford”. |
| dealerType | char | Code letter, such as “F” (for Ford) or “V” (for various). |
| carModelCode | integer | Six-digit ID, such as “766704” or “883704”. |
| totalSales | float | Dollar figure for a car sale, such as: “14499.95” |
| reportDate | timestamp | Transaction date, such as “2006-04-29 13:05:01”. |
| To validate **ddnReports**, use sample data file C:\temp\eBAM\Sample\Data\In**inputReports**5* | | |

### Procedures

- **“To create the sample eBAM application and data definitions” on page 79**
- **“To validate the metadata definition” on page 80**

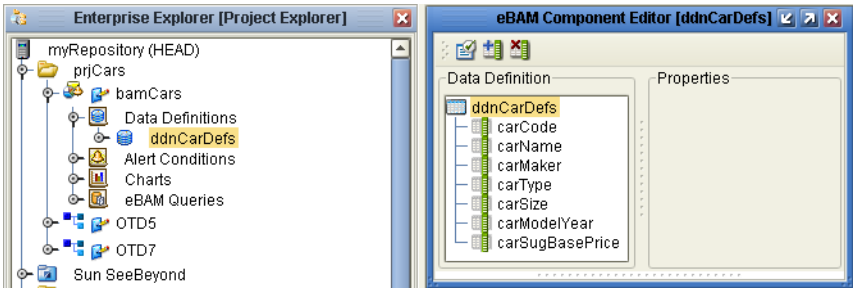
### To create the sample eBAM application and data definitions

1. In the project tree, right-click prjCars and, on the pop-up menu, point at **New** and click **eBAM Application**. The eBAM Application Wizard appears.
2. For Application Name: Type **bamCars** and click **Next**.
3. For Data Definition Name: Type **ddnCarDefs** and click **Next**.
4. The next step in the wizard prompts you to define the data definition elements: Click **Add** six times, and then supply column names and data types for the seven ddnCarDefs fields as shown in **Table 14 on page 79**. When you have specified all column names and data types, click **Next**.
5. The next step in the wizard prompts you to specify or bypass Data Retention. Leave the check box cleared and click **Next**.

6 The final step of the wizard allows you to go back as needed to review your choices. As needed, click **Back** and **Next** to return to a step and make changes. Click **Finish** when you are satisfied with the data definition.

In the left pane, under prjCars, the project tree displays a new application named bamCars. On the right side (the canvas), the eBAM Component Editor opens to display the data definition; see Figure 49.

**Figure 49** eBAM Component Editor Showing New Data Definition ddnCarDefs




7 In the project tree, under bamCars, right-click **Data Definitions** and click pop-up menu item **New Data Definition**. Then repeat steps 3 through 6 above to create the five-field data definition **ddnReports**, using the field names and data types shown in **Table 15 on page 79**.

**Note:** *Any time you complete a new data definition, it is good practice to use the **Show Sample Data** tool to double-check the data definition against sample data, preview it, and commit it for later use. Use the following procedure.*

### To validate the metadata definition

This procedure is optional, but highly recommended. It starts with **ddnCardefs**.

1 In the eBAM Editor, on the tool palette, click: **Show Sample Data**.

The Sample Data pane appears below the main eBAM Editor.

2 On the Sample Data tool palette, click: **Import**.

3 In the File Import wizard's **Select File** step: Browse to the location of the sample data files (C:\temp\eBAM\Sample\Data\In\) and select **inputCarDefs7*~in**.

4 In the following steps: Keep default choices shown in Table 16, and then click **Next.**

**Table 16** Choices for Imported Sample Data for Sample Data Definitions

| Item | Default |
|---|---|
| Encoding scheme | ASCII (ISO646-US) |
| File format | Delimited |
| Default SQL Type | varchar |
| Record Delimiter | {newline (lf)} |
| Field Delimiter | {comma} |
| Text Qualifier | none |

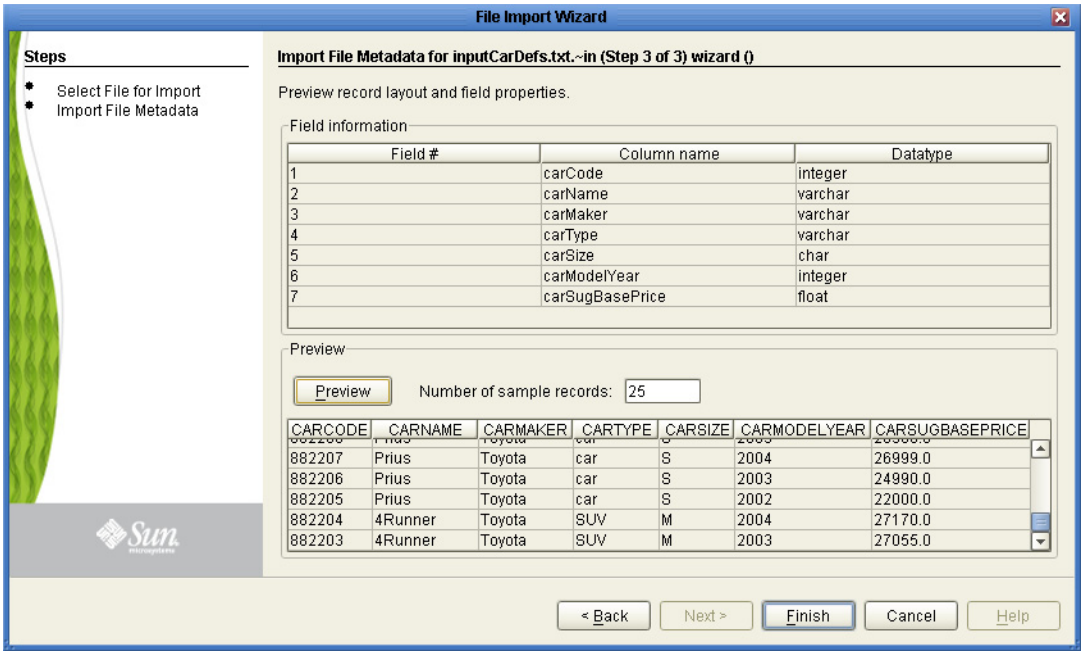
**Table 16** Choices for Imported Sample Data for Sample Data Definitions

| Item | Default |
|---|---|
| First line contains field names? | False |

5 In the next step, verify the record layout and field properties in the Field information pane, enter the number of sample records to read and display in the preview pane, and then click **Preview**.

If the sample data is valid (in accord with the layout, encoding, formatting, and properties you specified), the Preview pane displays a table whose rows are the first few records, with each column headed by the data element name. See Figure 50.

**Figure 50** Showing Sample Data: Preview of Data Definition Field Layout



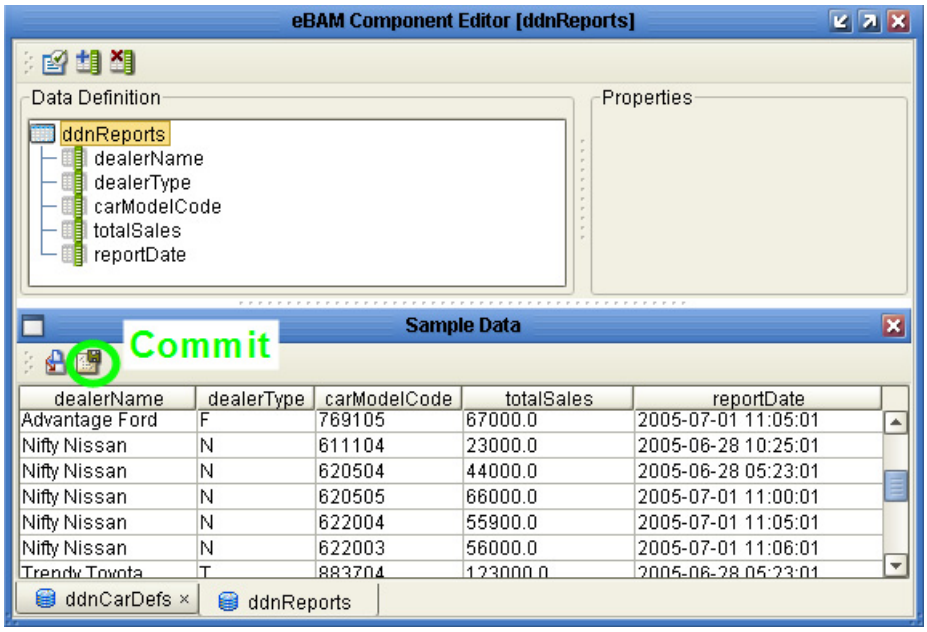

6 Click **Finish**.

7 In the toolbar of the Sample Data pane, click **Commit** (Figure 51 shows an example).

8 Back in the project tree, under bamCars, double-click ddnReports and repeat steps 1 through 6 above to validate ddnReports using sample input file **inputReports**5*.

The data set is parsed and displayed in the Sample Data pane. See Figure 51.

**Figure 51** Sample Data Displayed in Sample Data Pane




9 Click **Commit**.

**Note:** *When you finish a new data definition, it is good practice to commit sample data. This not only validates that you have set up the metadata correctly, it also makes the data available for other purposes, such as previewing the appearance of a chart.*

After a data definition has been created, configured, and validated, it is available for use in one or more queries.

## 8.2.4 Creating the eBAM Sample Queries

The procedures in this section explain how to create the queries in the eBAM sample.

**Table 17** Queries Included With the eBAM Sample

| Name | Type | Target Data Definition(s) | Operation and Purpose |
|---|---|---|---|
| qryS_CountDealerReports | Summary | ddnReports | Counts the dealerName field. |
| qryG_BelowMinimumSales | General.<br><br>Filtered. | ddnReports | Filters against the totalSales field only, watching for a value less than 1000.0.<br>Used by alertBelowMinimum. |
| qryG_ExtractSalesByCarName | General.<br><br>JoinView, filtered, with runtime input. | ddnReports, ddnCarDefs | Reports three items: carName (filtered to find only values that match the runtime input), carModel, and a KPI (the calculated sum of totalSales).<br>Web service **execute** is used in bpQryExtractSalesByCarName. |

**Table 17** Queries Included With the eBAM Sample (Continued)

| Name | Type | Target Data Definition(s) | Operation and Purpose |
|---|---|---|---|
| qryC_SumSalesByDealer | Category, but without Series. | ddnReports | Category is dealerName; value is a KPI (calculated sum of totalSales). |
| qryC_SumSalesByCarID | Category, but without Series. | ddnReports | Category is carModelCode; value is a KPI (the calculated sum of totalSales). Used by one chart, chBar_SalesByCarId. |
| qryCj_SumSalesByMakerAndCarID | Category, with Series.<br><br>JoinView | ddnReports, ddnCarDefs | Category is carMaker; series is carCode; Value is a KPI (the calculated sum of totalSales). |
| qryCj_SumSalesByCarnameAndYear | Category, with Series.<br><br>JoinView | ddnReports, ddnCarDefs | Category is carName; series is carModelYear; value is a KPI (the calculated sum of totalSales). Used by three charts: chBar_SalesByCarnameAndYear, chPie_SalesByDealer, and chBar_SalesByCarnameAndYear_stacked |

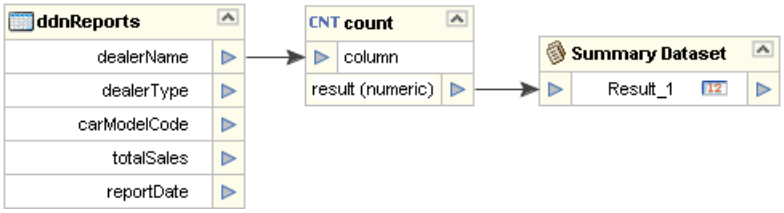
## eBAM Query qryS_CountDealerReports

This summary query simply counts how many reports are currently in the database.

**To create the qryS_CountDealerReports query**

1. In the project tree: Open prjCars > bamCars, right-click **eBAM Queries**, and click **New eBAM Query**. The New eBAM Query Wizard appears.
2. For Type, choose **Summary**; for Name, enter **qryS_CountDealerReports**; click **Next**.
3. Select the checkbox for **ddnReports** (only) and then click **Finish**.
4. From the Operator Palette (Number): Drag the **count** operator onto the canvas.
5. Connect the output of **dealerName** to the **column** input of **count**, and then connect the count **result** to **Result_1**. See Figure 52.

**Figure 52** Summary Query to Count Dealer Reports



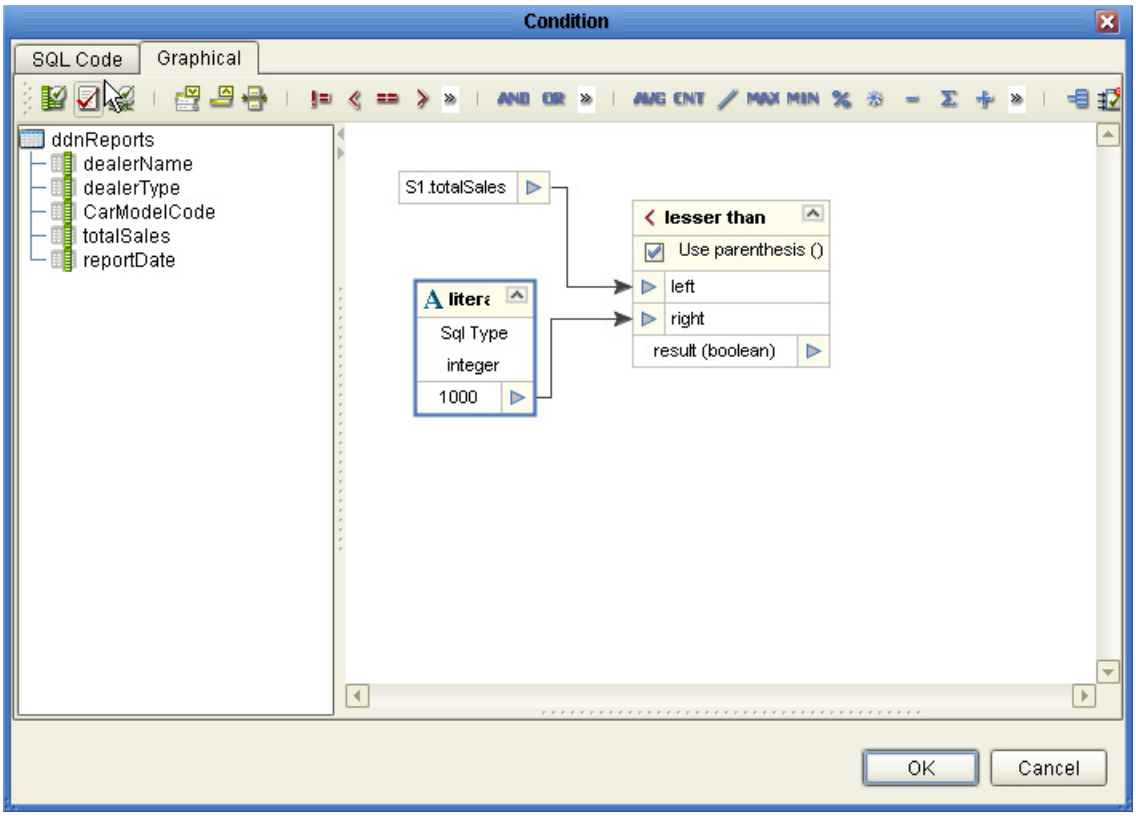
## qryG_BelowMinimumSales

This general query has a filter against totalSales, with a threshold of totalSales < 1000.0.

**To create the qryG_BelowMinimumSales query**

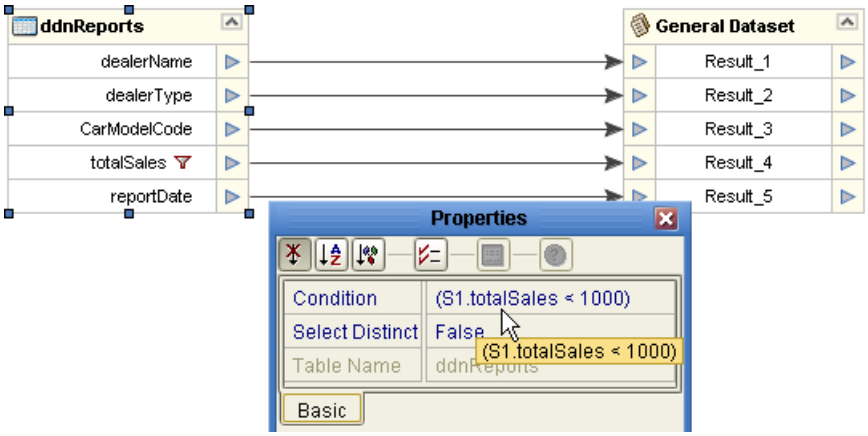
1. In the project tree: Open prjCars > bamCars, right-click **eBAM Queries**, and click **New eBAM Query**. The New eBAM Query Wizard appears.
2. For Type, choose **General**; for Name, enter **qryG_BelowMinimumSales**; click **Next**.
3. Select the checkbox for **ddnReports** (only) and then click **Finish**.
4. In the Component Editor, right-click ddnReports and then, in the Properties dialog box, for **Condition** click the ellipsis [...] to open the Condition editor.
5. In the Condition editor, using either SQL code or the graphical editor, construct this condition: S1.totalSales < 1000. See Figure 53.

**Figure 53** Setting a Condition on the totalSales Field




6. Validate the condition. Then click OK twice, to exit the editor and the dialog box.
7. In the Component Editor, right-click General Dataset and click **Configure**; then, in the Configure Dataset View dialog box, click **Add** four times, creating Result_2 through Result_5. Click OK to exit the dialog box, and then connect each field on the left with the corresponding column on the right. See Figure 54.

**Figure 54** General Query to Check the Condition totalSales < 1000.00



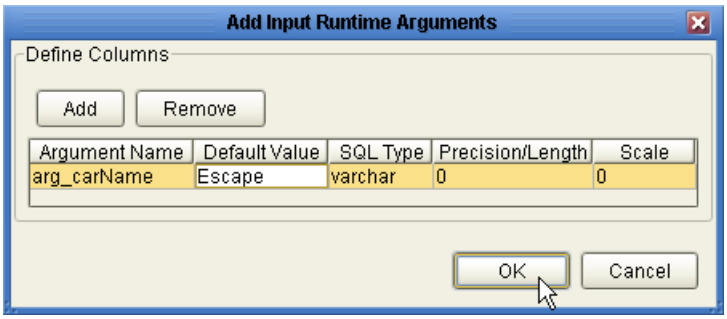

## qryG_ExtractSalesByCarName

This general query creates an inner-join of the two data definitions, filters against carName to check for a match against a runtime input, and sums totalSales. It provides an example of a dynamic query that uses a runtime argument; this allows you to create different outputs that vary dynamically according to the value you provide at run time for the queried argument. (In this sample, you will set up the Connectivity Map so that the output consists of files named **outputQryNameResults*.dat**.)

**To create the qryG_ExtractSalesByCarName query**

1. In the project tree: Open prjCars > bamCars, right-click **eBAM Queries**, and click **New eBAM Query**. The New eBAM Query Wizard appears.
2. For Type, choose **General**; for Name, enter **qryG_ExtractSalesByCarName**; click **Next**.
3. Select the checkboxes for **ddnReports** and **ddnCarDefs** and then click **Finish**.
4. On the toolbar, click the icon for **Add/Edit Runtime Inputs** icon.
5. In the **Add/Edit Input Runtime Arguments** dialog box: For Argument Name, change arg_0 to **arg_carName**; for Default Value, enter **Escape**; for the other columns, keep the defaults. (See Figure 55.) When finished, click **OK**.

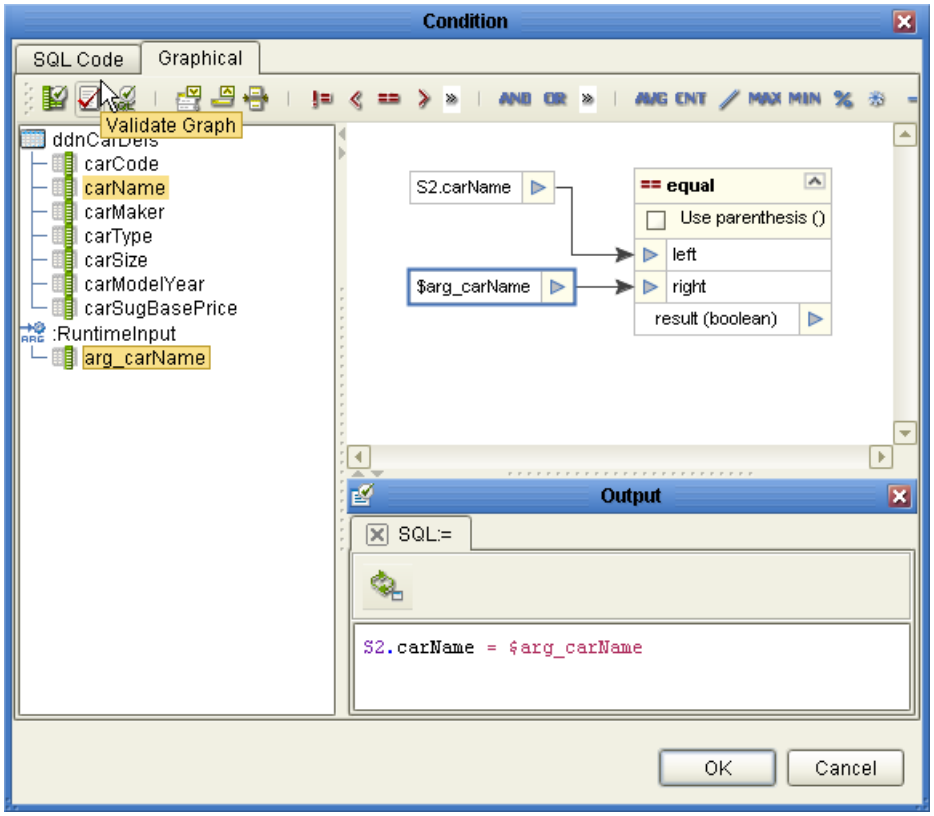
**Figure 55** Creating a Runtime Argument



6 In the Component Editor, right-click ddnCarDefs and then, in the Properties dialog box, for **Condition** click the ellipsis [...] to open the Condition editor.

7 In the Condition editor, using either SQL code or the graphical editor, construct this condition: **S2.carName = $arg_carName**. See Figure 56.

**Figure 56** Setting a Dynamic Argument Condition on the totalSales Field




8 Validate the condition. Then click OK twice, to exit the editor and the dialog box.

9 In the Component Editor, right-click General Dataset and click **Configure**; then, in the Configure Dataset View dialog, click **Add** two times and rename as follows:

- Rename Result_1 to Result_carName.
- Rename Result_2 to Result_carModelYear.
- Rename Result_3 to Result_SumOfSales.

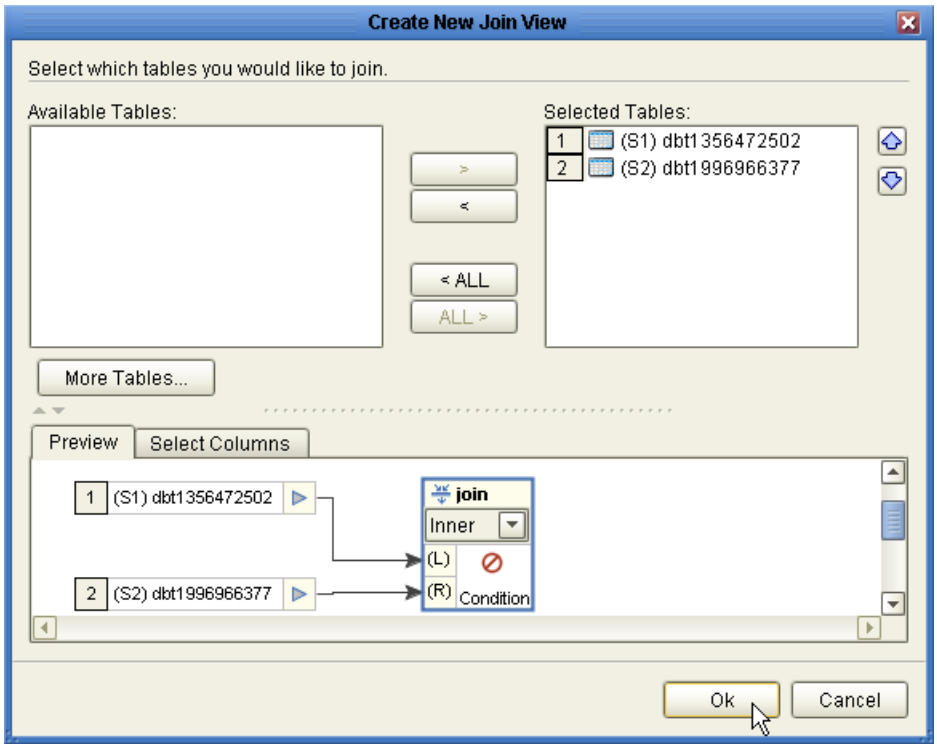
10 From the Operator Palette (Number): Drag the **sum** operator onto the canvas.

11 From ddnCarDefs: Connect the output of **carName** to the **Result_carName** input and connect the output of **carModelYear** to the **Result_carModelYear** input. Then, from ddnReports: Connect the output of **totalSales** to the **column** input of **sum** and connect the sum **result** to **Result_SumOfSales**.

12 In response to the **question** (“Create a join view?”), click **OK**.

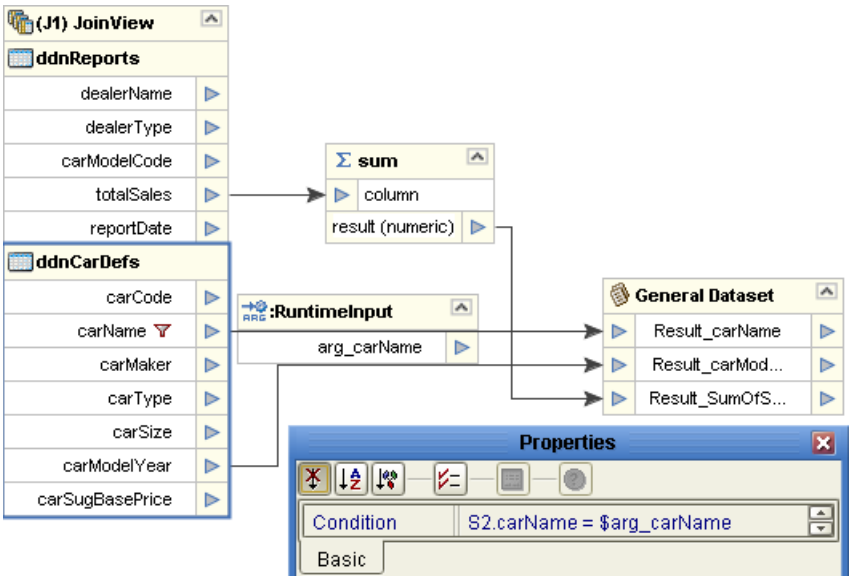
13 In the Create New Join View dialog box (see Figure 57), keep the default join type (Inner) and click **OK**.

**Figure 57** Inner Join




See Figure 58.

**Figure 58** Summary Query to Extract Sales for carName="Escape"



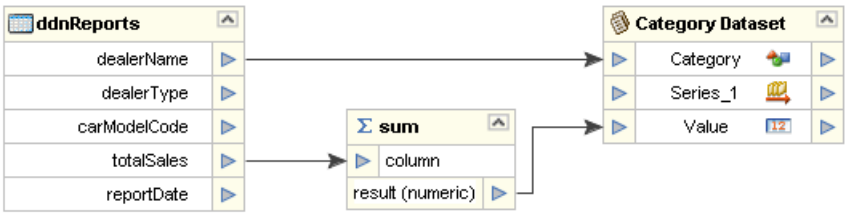
## eBAM Query qryC_SumSalesByDealer

This category query outputs dealerName as the category, has no series, and outputs the value computed by summing totalSales.

**To create the qryC_SumSalesByDealer query**

1. In the project tree: Open prjCars > bamCars, right-click **eBAM Queries**, and click **New eBAM Query**. The New eBAM Query Wizard appears.
2. For Type, choose **Category**; for Name, enter **qryC_SumSalesByDealer**; click **Next**.
3. Select the checkbox for **ddnReports** (only) then click **Finish**.
4. From the Operator Palette (Number): Drag the **sum** operator onto the canvas.
5. Connect the output of **dealerName** to the **Category** input, connect the output of **totalSales** to the **column** input of **sum**, and then connect the sum **result** to **Value**. See Figure 59.

**Figure 59** Category Query to Report Summed totalSales by dealerName



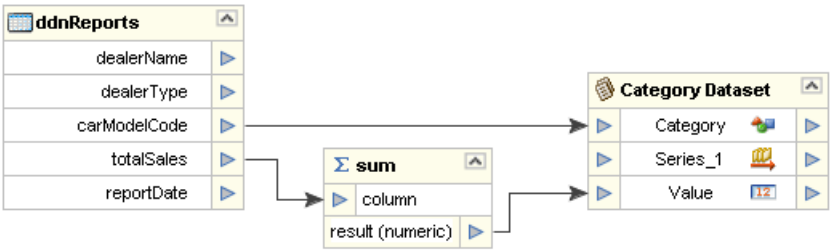

## eBAM Query qryC_SumSalesByCarID

This category query outputs carModelCode as the category, has no series, and outputs the value computed by summing totalSales.

**To create the qryC_SumSalesByCarID query**

1. In the project tree, open prjCars > bamCars, right-click **eBAM Queries**, and click **New eBAM Query**. The New eBAM Query Wizard appears.
2. For Type, choose **Category**; for Name, enter **qryC_SumSalesByCarID**; click **Next**.
3. Select the checkbox for **ddnReports** (only) then click **Finish**.
4. From the Operator Palette (Number): Drag the **sum** operator onto the canvas.
5. Connect the output of **carModelCode** to the **Category** input, connect the output of **totalSales** to the **column** input of **sum**, and then connect the sum **result** to **Value**. See Figure 60.

**Figure 60** Category Query to Report Summed totalSales by dealerName



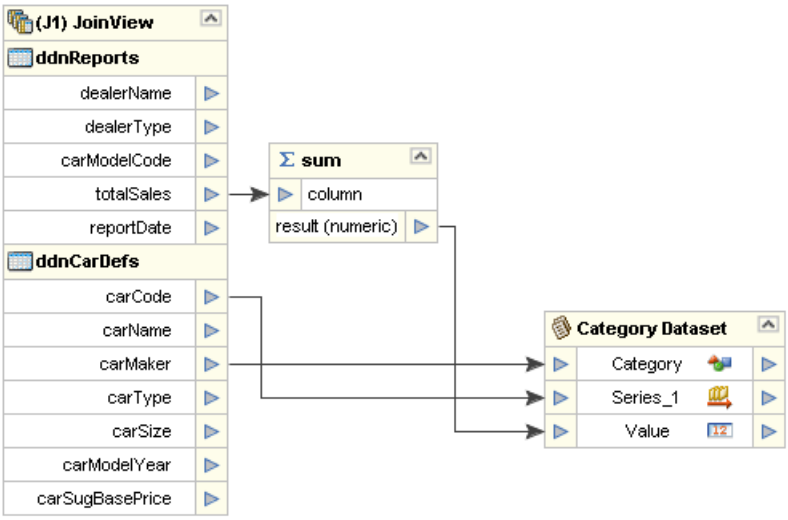

## eBAM Query qryCj_SumSalesByMakerAndCarID

This category query creates an inner-join of the two data definitions, outputs carMaker as the category and carCode as the only series, and outputs the value computed by summing totalSales.

### To create the qryCj_SumSalesByMakerAndCarID query

1. In the project tree: Open prjCars > bamCars, right-click **eBAM Queries**, and click **New eBAM Query**. The New eBAM Query Wizard appears.
2. For Type, choose **Category**; for Name, enter **qryCj_SumSalesByMakerAndCarID**; click **Next**.
3. Select the checkboxes for **ddnReports** and **ddnCarDefs**, and then click **Finish**.
4. From the Operator Palette (Number): Drag the **sum** operator onto the canvas.
5. From ddnCarDefs, connect the output of **carMaker** to the **Category** input and connect the output of **carCode** to the **Series_1** input; from ddnReports, connect the output of **totalSales** to the **column** input of **sum**, and then connect the sum **result** to **Value**.
6. In response to the **question** ("Create a join view?"), click **OK**.
7. In the Create New Join View dialog box (see **Figure 57 on page 87**), keep the default join type (Inner) and click **OK** (see Figure 61).

**Figure 61** Category Query to Report Sales by carMaker and then carCode



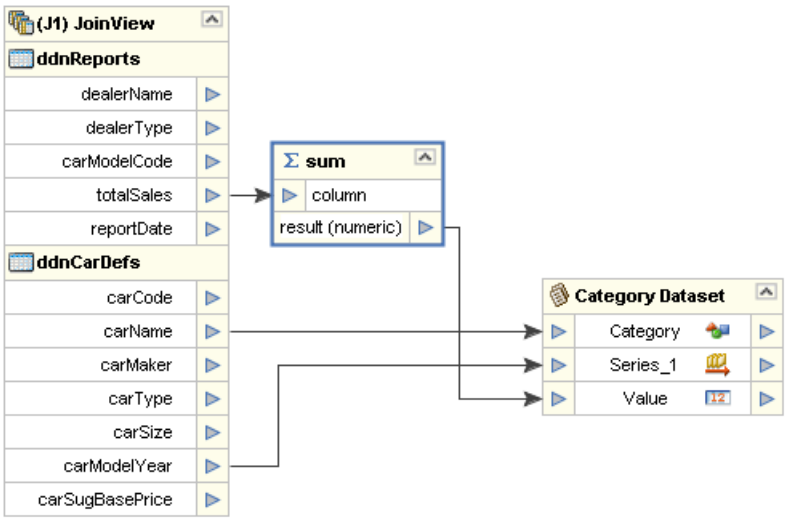

## eBAM Query qryCj_SumSalesByCarnameAndYear

This category query creates an inner-join of the two data definitions, outputs carName as the category and carModelYear as the only series, and outputs the value computed by summing totalSales.

**To create the qryCj_SumSalesByCarnameAndYear query**

1. In the project tree: Open prjCars > bamCars, right-click **eBAM Queries**, and click **New eBAM Query**. The New eBAM Query Wizard appears.
2. For Type, choose **Category**; for Name, enter **qryCj_SumSalesByCarnameAndYear**; click **Next**.
3. Select the checkboxes for **ddnReports** and **ddnCarDefs**, and then click **Finish**.
4. From the Operator Palette (Number): Drag the **sum** operator onto the canvas.
5. From ddnCarDefs, connect the output of **carName** to the **Category** input and connect the output of **carModelYear** to the **Series_1** input; from ddnReports, connect the output of **totalSales** to the **column** input of **sum**, and then connect the sum **result** to **Value**.
6. In response to the **question** ("Create a join view?"), click **OK**.
7. In the Create New Join View dialog box (see **Figure 57 on page 87**), keep the default join type (Inner) and click **OK** (see Figure 62).

**Figure 62** Category Query to Report Sales by carMaker and then carCode



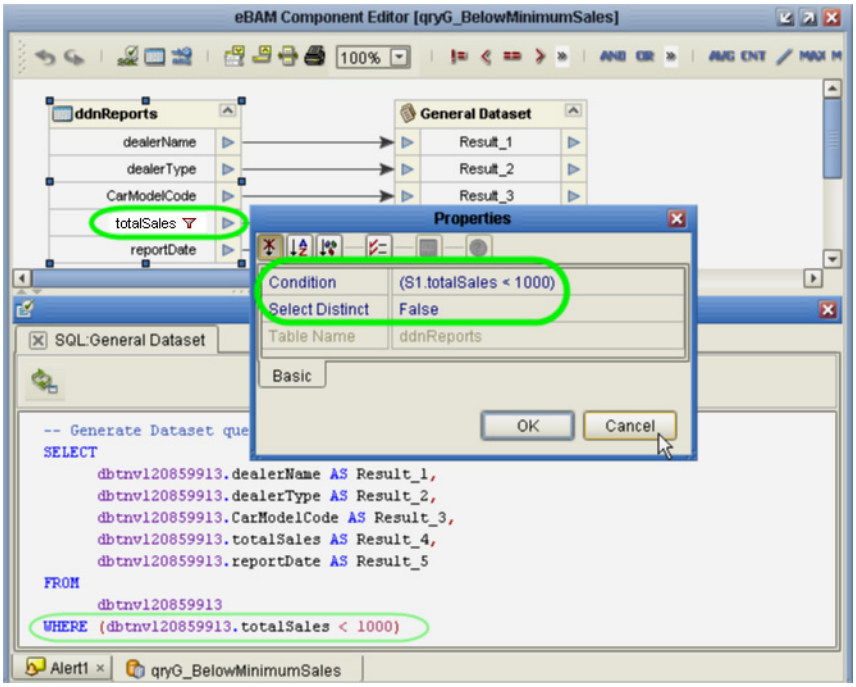

## 8.2.5 Creating the eBAM Sample Alert

The procedure in this section explains how to create and the alert used in the sample

**To create the alertBelowMinimum alert, based on general query**

1. In the project tree: Open prjCars > bamCars, right-click **Alert Conditions**, and click **New Alert**. When the alert is created, rename it to: **alertBelowMinimum**.
2. In the Component Editor, for Stored Query, choose **qryG_BelowMinimumSales**. To refresh your memory on how the query operates, click **Edit**. See Figure 63.

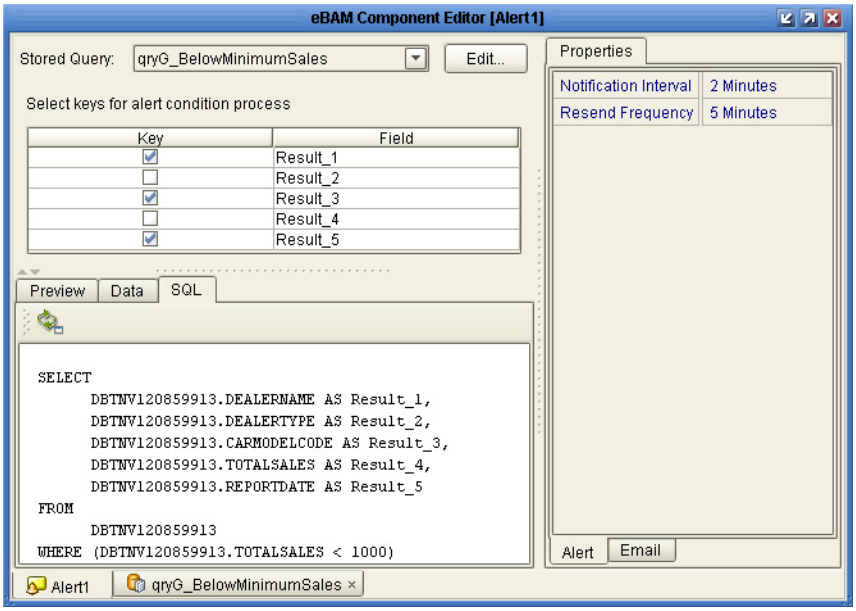
**Figure 63** General Query with a Condition




3 Back in the alertBelowMinimum tab, select the checkboxes for Result_1, Result_3, and Result_5; in the Alert tab, keep the default values for both Notification Interval.

As Figure 64 shows, the alert supplies three key results—dealer name (result 1), car model (result 3) and report date (result 5)—whenever total sales drop below $1,000; the condition is checked every 2 minutes, and alerts sent out every 5 minutes. In the Connectivity Map, files will be set up named **outputAlertBelowMinimum*.dat**.

**Figure 64** Alert for Notifying When Total Sales Drop Below $1,000.00



## 8.2.6 Creating the eBAM Sample Charts

The procedures in this section explain how to create and configure the charts used in the eBAM sample.

**Table 18** Charts Included With the eBAM Sample

| Name | Type | Query Details | Notes |
|---|---|---|---|
| chPie_SalesByDealer | Pie | qryC_SumSalesByDealer: Category = carName; no Series | Navigation: chBar_SalesByCarId |
| chBar_SalesByCarId | Bar (simple) | qryC_SumSalesByCarID: Category = CarModelCode; no Series | Navigation: chBar_SalesByCarnameAndYear |
| chBar_SalesByCarnameAndYear | Bar (simple) | qryCj_SumSalesByCarnameAndYear: Category = carName; series = carModelYear | Navigation: chBar_SalesByCarnameAndYear_stacked |
| chBar_SalesByCarnameAndYear_stacked | Bar (stacked) | qryCj_SumSalesByCarnameAndYear: Category = carName; series = carModelYear | No navigation |

### eBAM Chart chPie_SalesByDealer

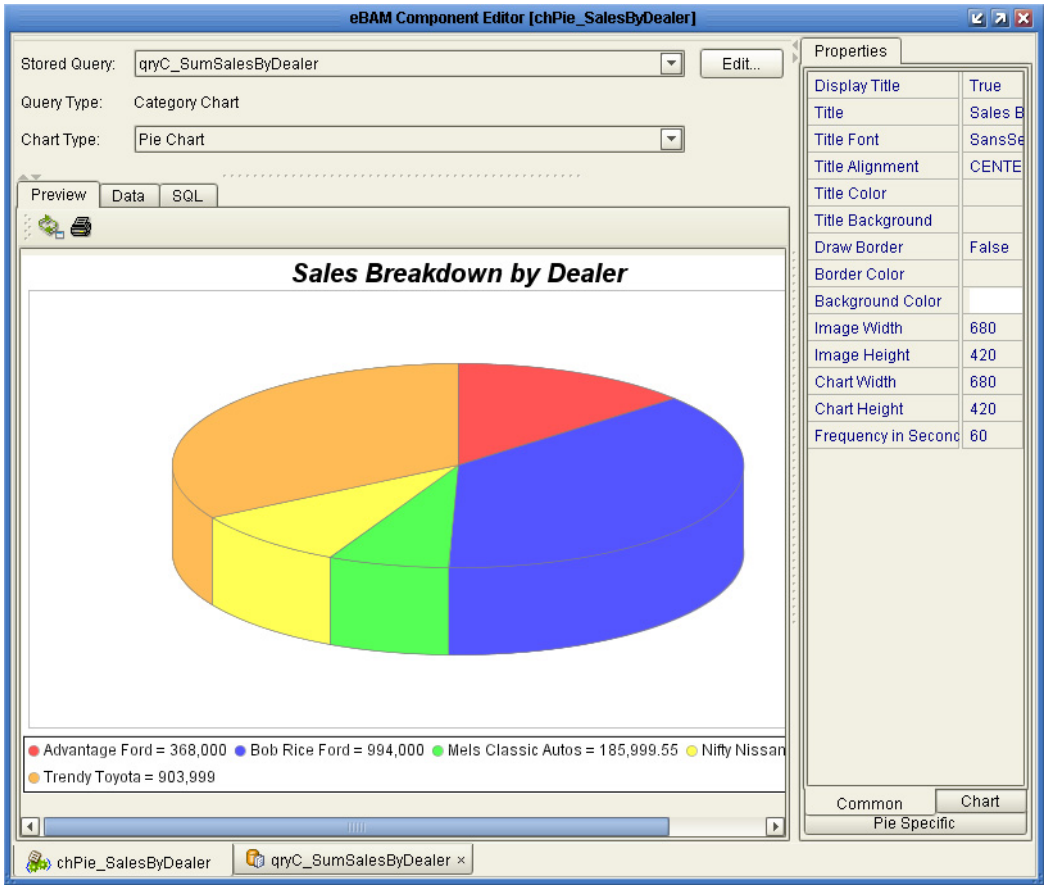
In this pie chart, each slice represents a different car dealer, and the size of the slice shows is proportional to that dealer's sales.

**To create the chPie_SalesByDealer chart**

1. In the project tree: Open prjCars > bamCars, right-click **Charts**, and click **New Chart**. Name the new chart: **chPie_SalesByDealer**
2. In the eBAM Component Editor: For Stored Query, choose **qryC_SumSalesByDealer**; for Chart Type, choose **Pie Chart**.
3. In the Properties pane:
   - (Common tab) For Title, enter: **Sales Breakdown by Dealer**
   - (Chart tab) For Include Legend, change to: **True**
4. In the eBAM Component Editor, Preview tab, click the **Refresh chart** icon.

   If you committed data for ddnReports as mentioned in the **procedure on page 80**, the Output pane displays the data reported by five dealerships. Each slice represents that dealer's contribution to the sum total of all sales reported. See Figure 65 and the upper left chart in **Figure 45 on page 71**.

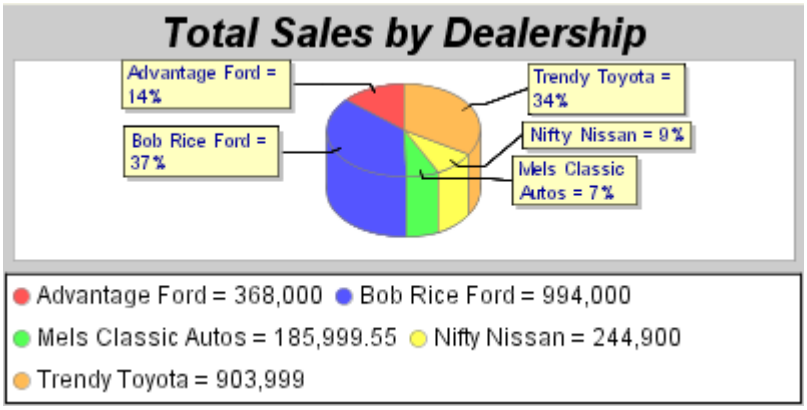
**Figure 65** Previewing a Category-Based Pie Chart Using the Committed Sample Data




**(optional) To experiment with the chPie_SalesByDealer chart**

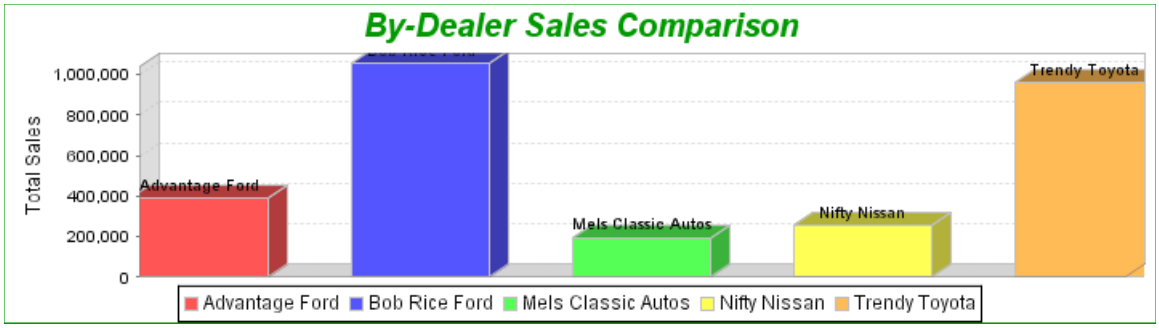
1. In the right pane of the eBAM Component Editor is a three-tabbed property sheet for the pie chart. Try out changes to various properties, such as:
   - In the **Common** tab, change the **Title** to: **Total Sales by Dealership**
   - In the **Common** tab, change **Image Width** and **Image Height** to: **500** and **200**
   - In the **Chart** tab, change **Depth Factor** to **0.4** and **Circular** to **True**
   - In the **Pie-Specific** tab, change the **Show Section Labels** to: **True**
2. In the Preview pane, click **Refresh chart**. Notice how the chart title and dimensions change, the pie has become a cylinder, and the labels are called out in boxes.
3. Repeat the previous two steps as often as you like, to explore how the various chart properties affect the pie chart display. See Figure 66, for example.

**Figure 66** Category Chart chPie_SalesByDealer, With Modified Chart Properties




4 To view a bar chart of the same data, simply change the Chart Type to **Bar Chart** and click **Refresh chart**. See Figure 67, for example.

**Figure 67** Category Chart chPie_SalesByDealer Redrawn As a Bar Chart




5 To swap back and forth between the visual representation and the raw numeric data, swap back and forth between the Data tab and the Preview tab.

## eBAM Chart chBar_SalesByCarId

In this bar chart, each bar represents a different car ID, a six-digit code that combines make, model, and year. Total sales of each car ID are represented by the bar length.

**To create the chBar_SalesByCarId chart**

1 In the project tree: Open prjCars > bamCars, right-click **Charts**, and click **New Chart**. Name the new chart: **chBar_SalesByCarId**.

2 In the eBAM Component Editor: For Stored Query, choose **qryC_SumSalesByCarID**; for Chart Type, choose **Bar Chart**.

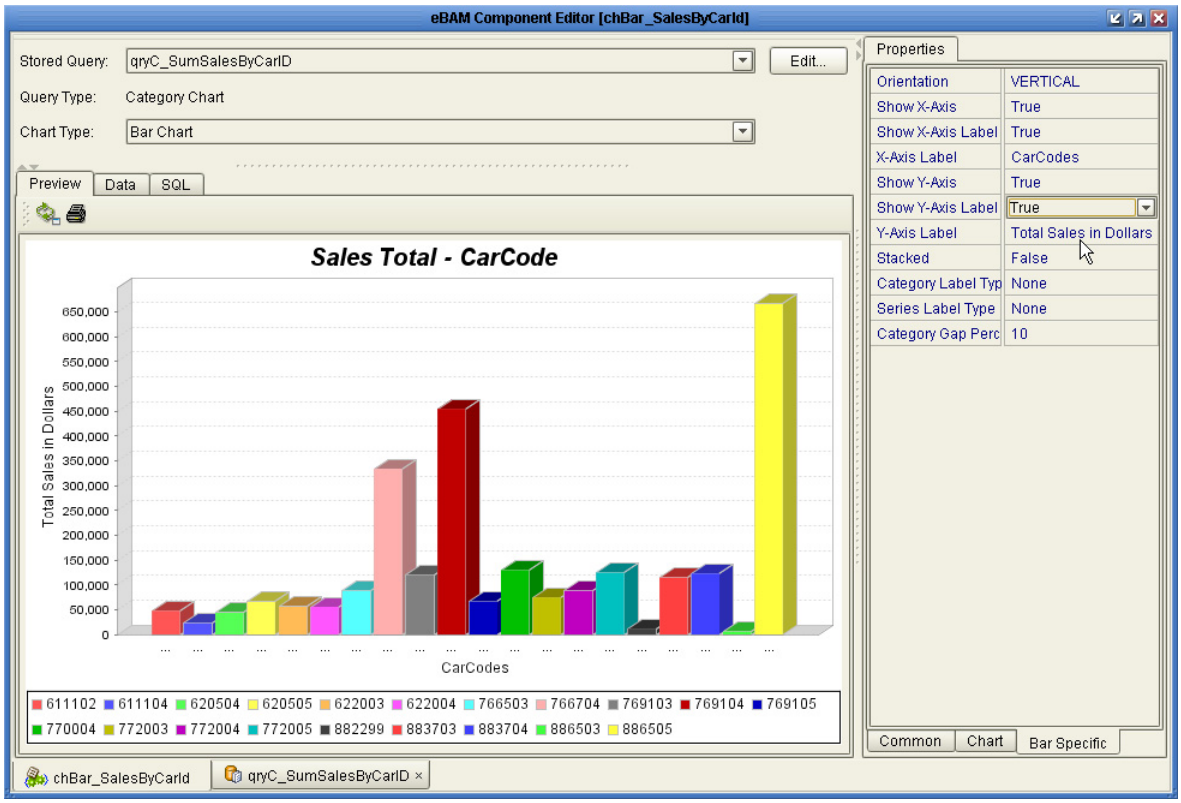
3 In the Properties pane:

- (Common tab) For Title, enter: **Sales Total - CarCode**
- (Chart tab) For Include Legend, change to: **True**
- (Bar Specific tab) For X-Axis Label, change to: **Car Codes**
  (Bar Specific tab) For Y-Axis Label, change to: **Total Sales in Dollars**

4 In the eBAM Component Editor, Preview tab, click the **Refresh chart** icon.

If you committed data for ddnReports as mentioned in the **procedure on page 80**, the Output pane displays the data reported by five dealerships. Each bar represents a different car make-model-year, so the highest-grossing units can be seen at a glance. See Figure 68 and the upper right chart in **Figure 45 on page 71**.

**Figure 68** Previewing a Simple Bar Chart Using the Committed Sample Data



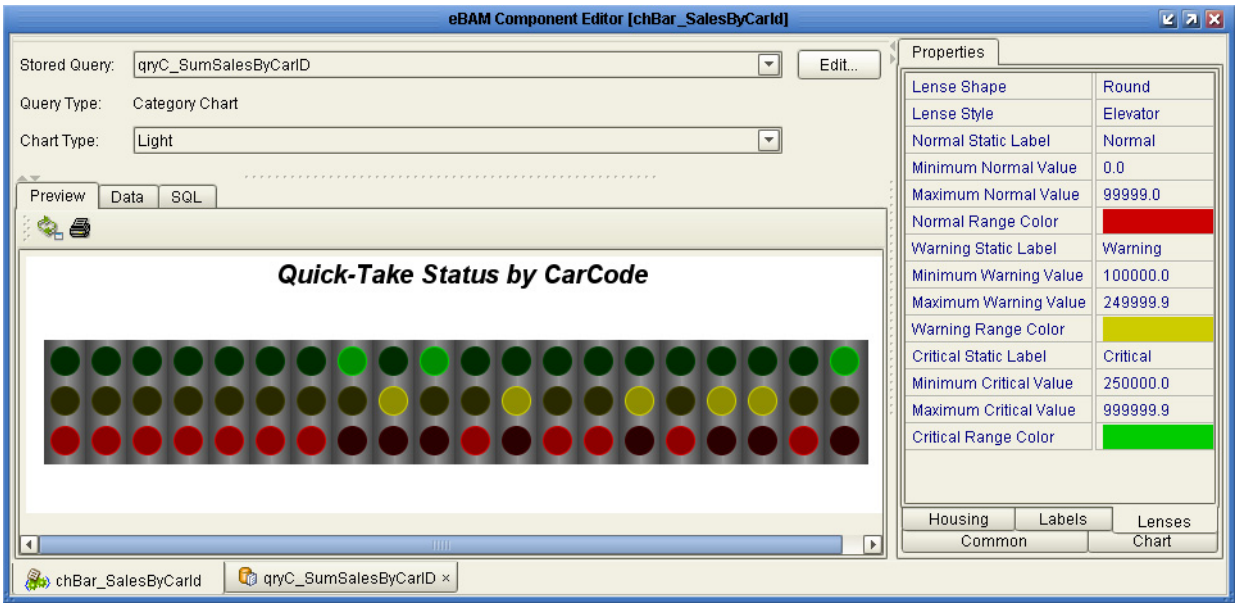

**(optional) To experiment with the chBar_SalesByCarID chart**

1 In the eBAM Component Editor, change the chart type from Bar Chart to Light, and make the following adjustments in the properties:

- In the **Common** tab, change **Title** to: **Quick-Take Status by CarCode**
  In the **Common** tab, change **Image Height** and **Chart Height** to: **200** and **220**
- In the **Housing** tab, change **Linearize Data** to: **True**
  In the **Housing** tab, change **Use Fixed Horizontal Display Limit** to: **False**
- In the **Lenses** tab, change **Maximum Normal Value** to: **99999.9**
  In the **Lenses** tab, change **Minimum Warning Value** to: **100000.0**
  In the **Lenses** tab, change **Maximum Warning Value** to: **249999.9**
  In the **Lenses** tab, change **Minimum Critical Value** to: **250000.0**
  In the **Lenses** tab, change **Maximum Warning Value** to: **999999.9**

2 In the Preview pane, click **Refresh chart**. Compare the new result in Figure 69 to the previous display in **Figure 68 on page 96**.

**Figure 69** Category Chart chBar, Modified to a Trafficlight Array




3 Repeat the previous two steps as often as you like, to explore how the various chart properties affect the trafficlight array display.

## eBAM Chart chBar_SalesByCarnameAndYear

In this category/series bar chart, based on a join query, the bars are clustered by model, and each individual bar is a model year. Total sales are represented by the bar length.

**To create the chBar_SalesByCarnameAndYear**

1 In the project tree: Open prjCars > bamCars, right-click **Charts**, and click **New Chart**. Name the new chart: **chBar_SalesByCarnameAndYear**

2 In the eBAM Component Editor: For Stored Query, choose **qryCj_SumSalesByCarnameAndYear**; for Chart Type, choose **Bar Chart**.

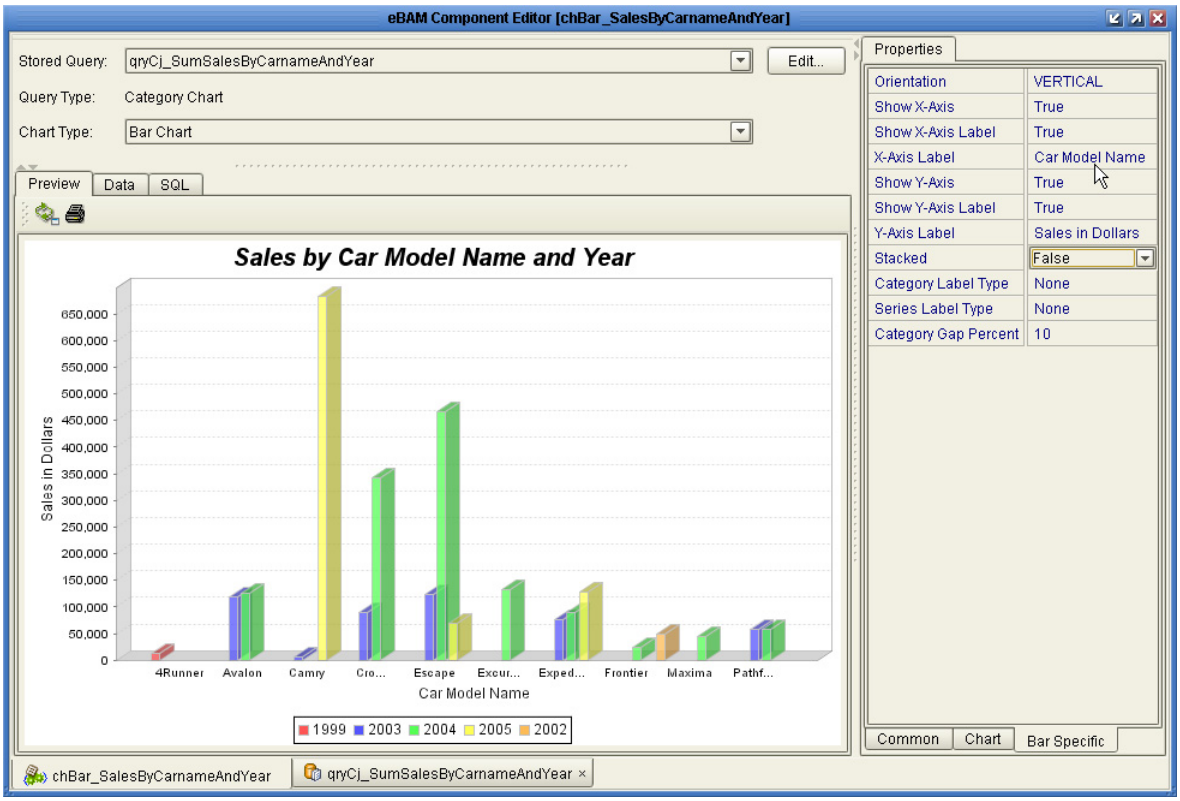
3 In the Properties pane:

- (Common tab) For Title, enter: **Sales by Car Model Name and Year**
- (Chart tab) For Include Legend, change to: **True**
- (Bar Specific tab) For X-Axis Label, change to: **Car Model Name**
  (Bar Specific tab) For Y-Axis Label, change to: **Sales in Dollars**

4 In the eBAM Component Editor, Preview tab, click the **Refresh chart** icon.

If you committed data for both ddnReports and ddnCarDefs, the Output pane displays the sales data (from ddnReports), parsed by model name and year (from CarDefs). This is the same data shown in the previous chart, without the need to know the car IDs. See Figure 70 and the lower left chart in **Figure 45 on page 71**.

**Figure 70** Previewing a Category-Series Bar Chart Using All Committed Sample Data




## eBAM Chart chBar_SalesByCarnameAndYear_stacked

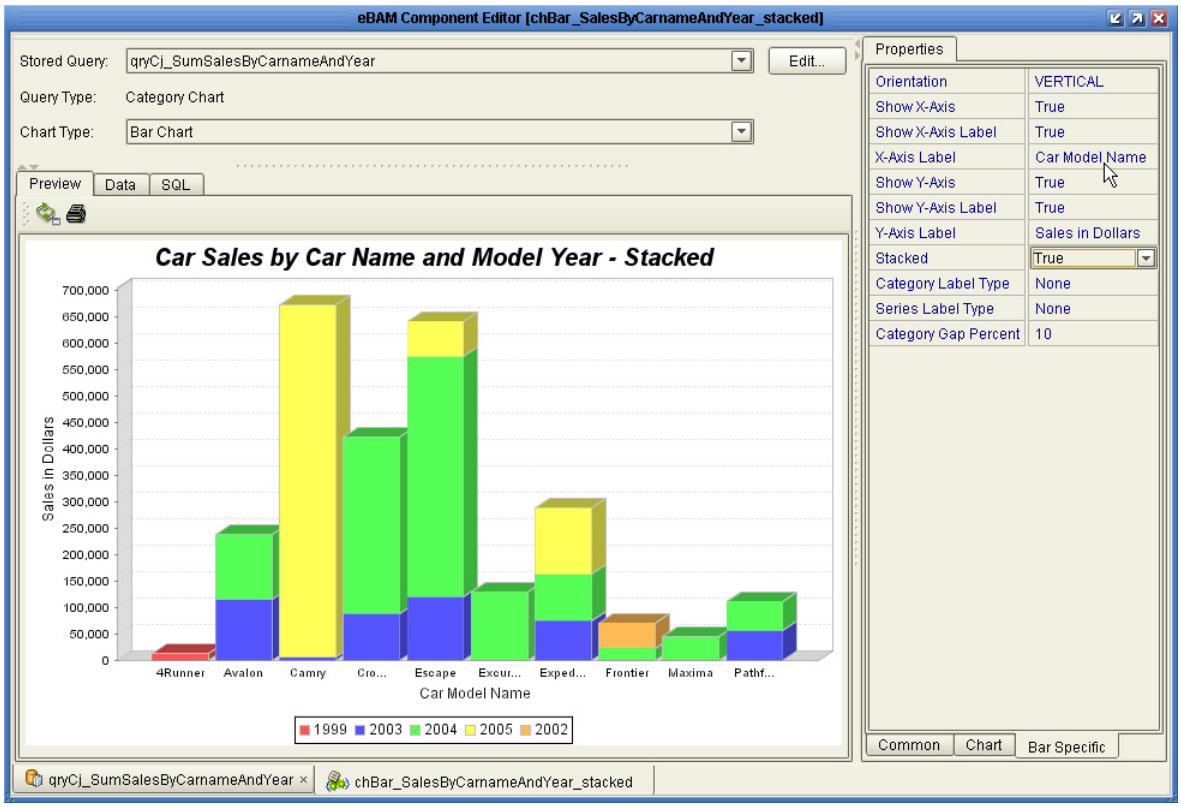
In this category/series bar chart, based on a join query, the bars stacks are models, and each block in the stack is a model year. Total sales are represented by the bar length.

**To create the chBar_SalesByCarnameAndYear_stacked**

1. In the project tree: Open prjCars > bamCars, right-click **Charts**, and click **New Chart**. Name the new chart: **chBar_SalesByCarnameAndYear_stacked**.
2. In the eBAM Component Editor: For Stored Query, choose **qryCj_SumSalesByCarnameAndYear**; for Chart Type, choose **Bar Chart**.
3. In the Properties pane:
   - (Common tab) For Title, enter: **Sales by Car Name and Model Year - Stacked**
   - (Chart tab) For Include Legend, change to: **True**
   - (Bar Specific tab) For X-Axis Label, change to: **Car Model Name**
     (Bar Specific tab) For Y-Axis Label, change to: **Sales in Dollars**
     (Bar Specific tab) For Stacked, change to: **True**
4. In the eBAM Component Editor, Preview tab, click the **Refresh chart** icon.

   This is the same data shown in the previous chart, but stacked instead of clustered. See Figure 71 and the lower right chart in **Figure 45 on page 71**.

**Figure 71** Previewing a Category-Series Bar Chart Using All Committed Sample Data




## 8.2.7 Creating Navigation Links

The procedure in this section explains how to set up the links for navigating from one chart to another.

### To create navigation links

1. Open chPie_SalesByDealer and set the following Properties in the Charts tab:
   - Change **Display Navigation Buttons**, to **True**.
   - For Navigation Chart Name, enter: **chBar_SalesByCarId**
2. Open chBar_SalesByCarId and set the following Properties in the Charts tab:
   - Change **Display Navigation Buttons**, to **True**.
   - For Navigation Chart Name, enter: **chBar_SalesByCarnameAndYear**
3. Open chBar_SalesByCarnameAndYear and set the following Properties in the Charts tab:
   - Change **Display Navigation Buttons**, to **True**.
   - For Navigation Chart Name, enter: **chBar_SalesByCarnameAndYear_stacked**.

## 8.2.8 Creating and Validating the Business Processes

These procedures help you get acquainted with the sample business processes (BPs) by taking you through steps for creating, configuring, and validating them.

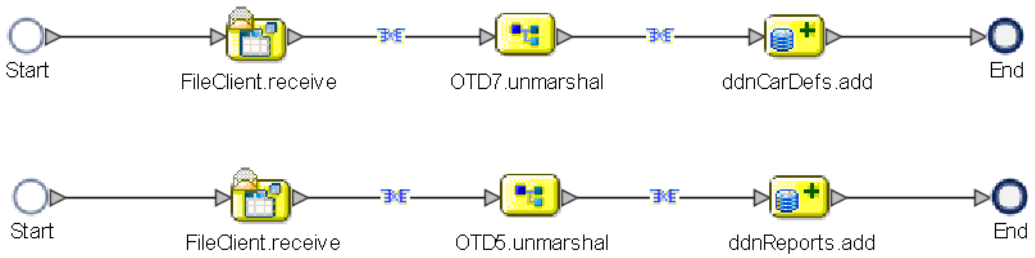
**Table 19** BPs Included With the eBAM Sample

| Name | Purpose | Web Services, Activities, and Methods |
|---|---|---|
| bpAddCarDefs | Polls a file, reads data and parses into seven fields, and adds it to a data definition (ddnCarDefs). | FileClient.**receive**; OTD7.**unmarshal**; ddnCarDefs.**add** |
| bpAddReports | Polls a file, reads data and parses into five fields, and adds it to a data definition (ddnReports). | FileClient.**receive**; OTD5.**unmarshal**; ddnReports.**add** |
| bpDelTables | Polls a file; if found, deletes data from both data definitions. | FileClient.**receive**; ddnCarDefs.**delete**; ddnReports.**delete** |
| bpQryExtractSalesByCarName | Polls a file, reads a single datum, passes it as a runtime argument to the execute web service, marshals the resulting output and writes to an output file. | FileClient.**receive**; qryG_ExtractSalesByCarName .**execute**; OTD3.**marshal**; FileClient.**write** |
| bpAlertBelowMinimum | Samples datastream for a threshold condition; if true, marshals the data and writes to an output file. | alertBelowMinimum.**notify**; OTD5.**unmarshal**; FileClient.**write** |

### Business Processes bpAddCarDefs and bpAddReports

The bpAddCarDefs and bpAddReports business processes operate in identical fashion: Read the data (using the **receive** web service of the FileClient), parse the data (using the **unmarshal** method of the correct OTD), and put the data into the eBAM application (using the **add** web service of the corresponding data definition. See Figure 72.

**Figure 72** Business Processes bpAddCarDefs and bpAddReports




#### To create the bpAddCarDefs business processes

1. In the project tree, right-click prjCars and, on the pop-up menu, point at **New** and click **Business Process**.

The eInsight Business Process Designer appears.

2 Rename the new business process from BusinessProcess1 to **bpAddCarDefs**.

3 In the project tree, open Sun SeeBeyond > eWays > File > **FileClient** and drag its **receive** activity onto the canvas.

4 In the project tree, open prjCars > OTD7 and drag its **unmarshal** activity onto the canvas.

5 In the project tree, open prjCars > bamCars > Data Definitions > **ddnCarDefs** and drag its **add** web service onto the canvas.

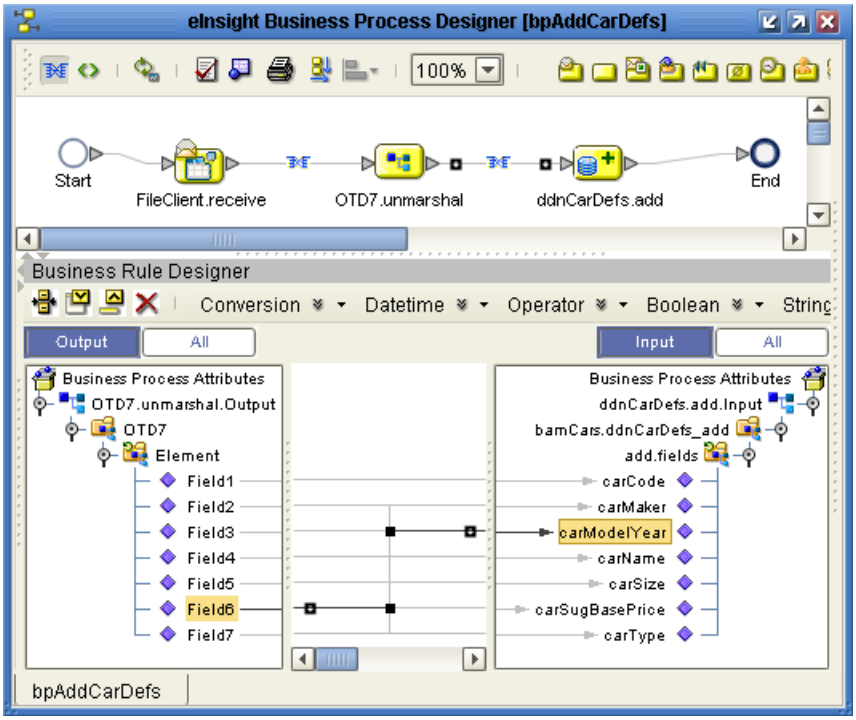
6 Connect the output of Start to the input of FileClient.**receive**; connect the output of **receive** to the input of OTD7.**unmarshal** and add a Business Rule; connect the output of **unmarshal** to the input of ddnCardefs.**add** and add a business rule; connect the output of **add** to the input of End. See the upper half of **Figure 72 on page 100**.

7 Open the Business Rules Designer and add the following transformation mappings.

A For **receive**-to-**unmarshal**, open both OTDs and then map the...Output **text** element to the...Input.**contents** element.

B For **unmarshal**-to-**add**, open...Output > OTD7 > **Element** and...Input >...ddnCarDefs_add > **add.fields** and then map as follows: Field1 to carCode, Field2 to carName, Field3 to carMaker, Field4 to carType, Field5 to carSize, Field6 to carModelYear, and Field7 to carSugBasePrice. See Figure 73.

**Figure 73** Mapping OTD7.unmarshal.Output to ddnCarDefs.add.Input




8 In the toolbar of the BP Designer, click **Validate Business Process Model**.

The bpAddReports model is valid except for its unused Fault attributes. (You can clear these: Right-click the BP in the project tree, open its properties and click the BP Attributes tab, and then delete Fault attributes whose In Use value is No.)

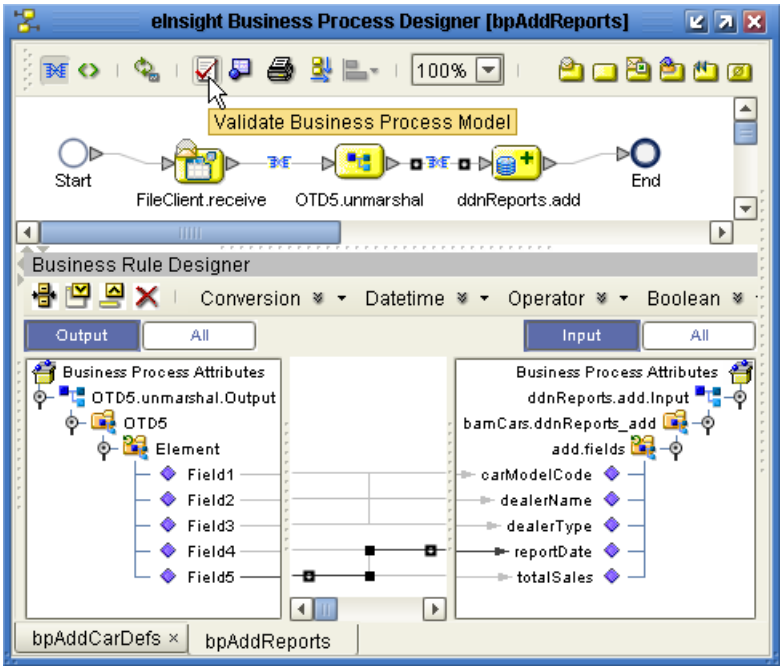
### To create the bpAddReports business processes

1. In the project tree, right-click prjCars and, on the pop-up menu, point at **New** and click **Business Process**.

   The eInsight Business Process Designer appears.

2. Rename the new business process from BusinessProcess1 to **bpAddReports**.
3. In the project tree, open Sun SeeBeyond > eWays > File > **FileClient** and drag its **receive** activity onto the canvas.
4. In the project tree, open prjCars > OTD*5* and drag its **unmarshal** activity onto the canvas.
5. In the project tree, open prjCars > bamCars > Data Definitions > **ddnCarDefs** and drag its **add** web service onto the canvas.
6. Connect the output of Start to the input of FileClient.**receive**; connect the output of **receive** to the input of OTD5.**unmarshal** and add a Business Rule; connect the output of **unmarshal** to the input of ddnReports.**add** and add a business rule; connect the output of **add** to the input of End. See the lower half of **Figure 72 on page 100**.
7. Open the Business Rules Designer and add the following transformation mappings:
   A. For **receive**-to-**unmarshal**, open both OTDs and then map the...Output **text** element to the...Input.**contents** element.
   B. For **unmarshal**-to-**add**: Open...Output > OTD5 > **Element** and...Input >...ddnReports_add > **add.fields** and then map as follows: Field1 to dealerName, Field2 to dealerType, Field3 to carModelCode, Field4 to totalSales, and Field5 to reportDate. See Figure 74.

**Figure 74** Mapping OTD5.unmarshal.Output to ddnReports.add.Input



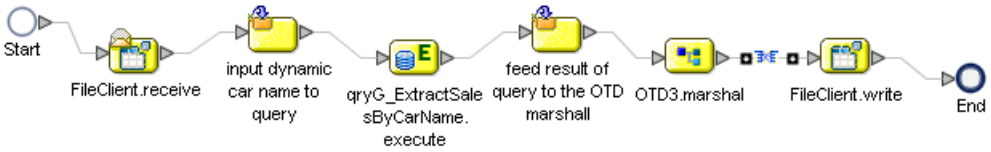

8 In the toolbar of the BP Designer, click **Validate Business Process Model**.

The bpAddReports model is valid except for its unused Fault attributes.

## Business Process bpQryExtractSalesByCarName

The bpQryExtractSalesByCarName illustrates using dynamic input to a query: It reads data (using the **receive** web service of the FileClient), and then invokes the **execute** web service of the two data definitions. See Figure 77.

**Figure 75** Business Process bpQryExtractSalesByCarName




### To create the bpQryExtractSalesByCarName business processes

1 In the project tree, right-click prjCars and, on the pop-up menu, point at **New** and click **Business Process**.

The eInsight Business Process Designer appears.

2 Rename the BP from BusinessProcess1 to **bpQryExtractSalesByCarName**.

3 In the project tree, open Sun SeeBeyond > eWays > File > **FileClient** and drag its **receive** activity onto the canvas.

4 From the tool palette, drag a Business Rule onto the canvas and rename it to: **input dynamic car name to query**.

5 In the project tree, open prjCars > bamCars > Data Definitions > **ddnReports** and drag its **delete** web service onto the canvas.

6 From the tool palette, drag a Business Rule onto the canvas and rename it to: **feed result of query to the OTD marshal**.

7 In the project tree, open prjCars > OTD*3* and drag its **marshal** activity onto the canvas.

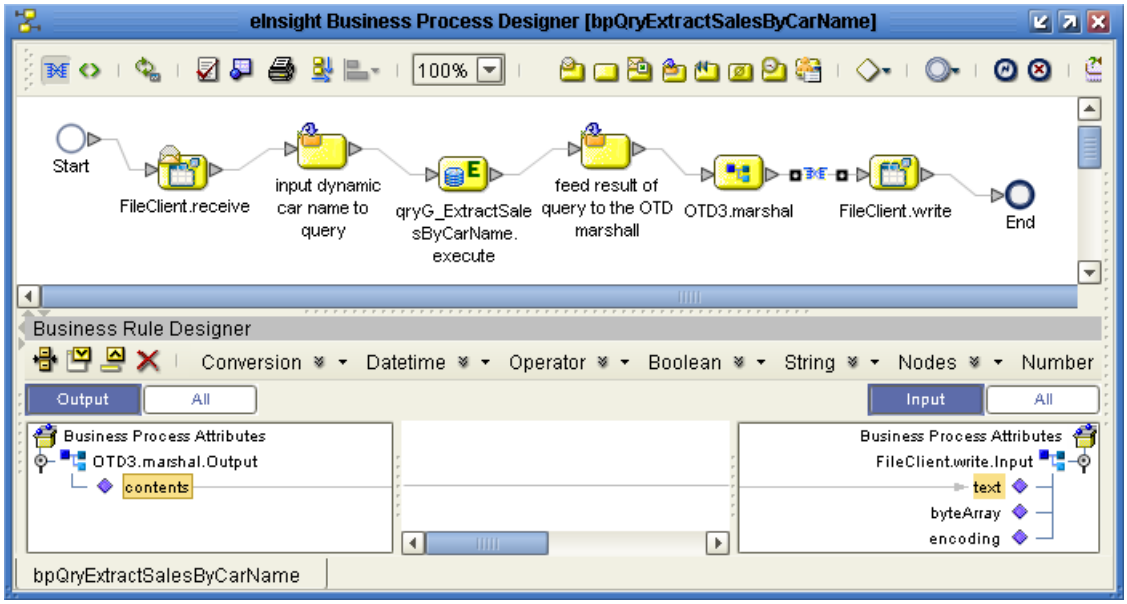
8 In the project tree, from Sun SeeBeyond > eWays > File > **FileClient**, drag its **write** activity onto the canvas.

9 Connect the output of Start to the input of FileClient.**receive**; connect the output of **receive** to the input of the first Business Rule ("input dynamic ..."); connect the output of the first Business Rule to the input of qryG_...**execute**; connect the output of **execute** to the input of the second Business Rule ("feed result ..."); connect the output of the second Business Rule to the input of OTD3.**marshal**; connect the output of **marshal** to the input of FileClient.**write** and add a business rule; connect the output of **write** to the input of End. See **Figure 77 on page 105**.

10 Open the Business Rules Designer and add the following transformation mapping:

- For **marshal**-to-**write**: Open both sides and then map the...Output **contents** element to the...Input.**text** element. See Figure 79.

**Figure 76** Mapping OTD3.marshal.Output to FileClient.write.Input




11 In the toolbar of the BP Designer, click **Validate Business Process Model**.

The bpQryExtractSalesByCarName model is valid except for its unused Fault attributes.

## Business Process bpDelTables

The bpDelTables business process operates even more simply as the bpAdd* processes, but with opposite result: It reads data (using the **receive** web service of the FileClient), and then invokes the **delete** web services of the two data definitions. See Figure 77.

**Figure 77** Business Process bpDelTables


### To create the bpDelTables business processes

1. In the project tree, right-click prjCars and, on the pop-up menu, point at **New** and click **Business Process**.

   The eInsight Business Process Designer appears.

2. Rename the new business process from BusinessProcess1 to **bpDelTables**.
3. In the project tree, open Sun SeeBeyond > eWays > File > **FileClient** and drag its **receive** activity onto the canvas.
4. In the project tree, open prjCars > bamCars > Data Definitions > **ddnCarDefs** and drag its **delete** web service onto the canvas.
5. In the project tree, open prjCars > bamCars > Data Definitions > **ddnReports** and drag its **delete** web service onto the canvas.
6. Connect the output of Start to the input of FileClient.**receive**; connect the output of **receive** to the input of ddnCarDefs.**delete**; connect the output of the first **delete** to the input of ddnReports.**delete**; connect the output of the second **delete** to the input of End. See **Figure 77 on page 105**.
7. In the toolbar of the BP Designer, click **Validate Business Process Model**.

   The bpDelTables model is valid except for its unused Fault attributes.

## Business Process bpAlertBelowMinimum

The bpAlertBelowMinimum business process operates as simply as the others, but does not introduce any change: It watches the data and, when the filtering condition in its **when** clause is satisfied by the data, invokes its **notify** web service to pass data (via the **marshal** method of OTD5) out to the **write** web service of the FileClient. See Figure 78.

**Figure 78** Business Process bpAlertBelowMinimum

### To create the bpAlertBelowMinimum business processes

1 In the project tree, right-click prjCars and, on the pop-up menu, point at **New** and click **Business Process**.

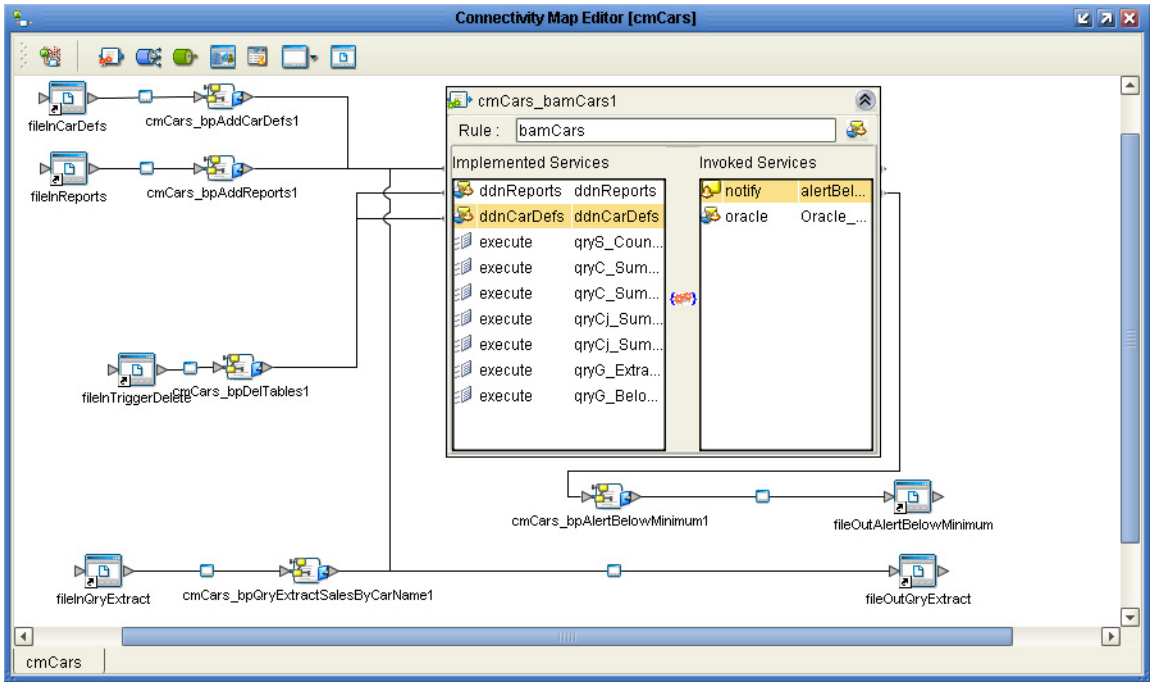
The eInsight Business Process Designer appears.

2 Rename the new business process to **bpAlertBelowMinimum**.

3 In the project tree, open prjCars > bamCars > Alert Conditions > **alertBelowMinimum** and drag its **notify** web service onto the canvas.

4 In the project tree, open prjCars > OTD5 and drag its **marshal** activity onto the canvas.

5 In the project tree, open Sun SeeBeyond > eWays > File > **FileClient** and drag its **write** activity onto the canvas.

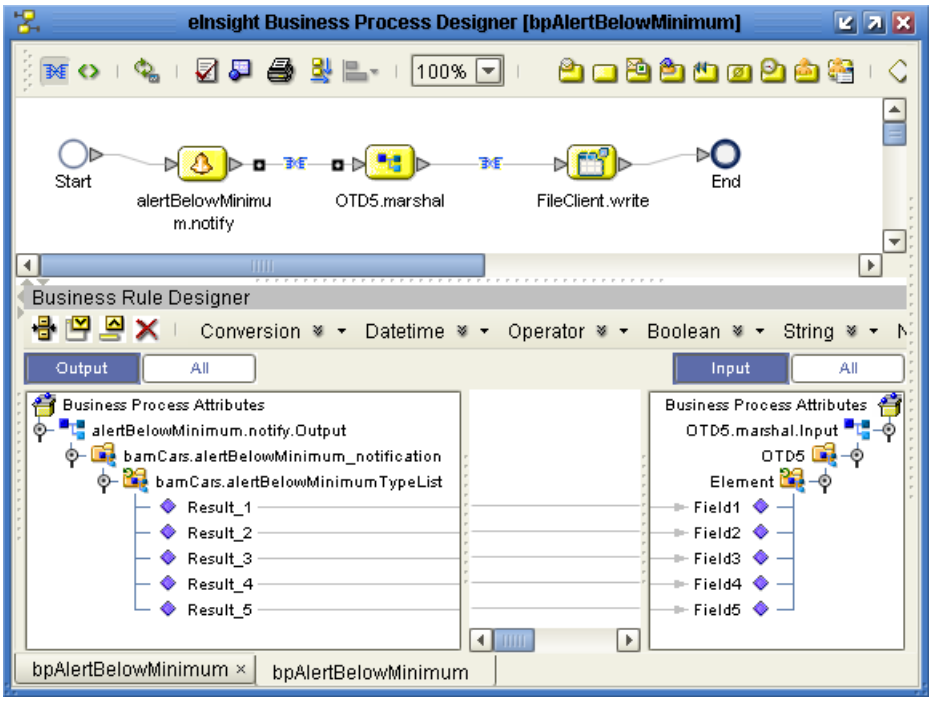



6 Connect the output of Start to the input of alertBelowMinimum.**notify**; connect the output of **notify** to the input of OTD5.**marshal** and add a Business Rule; connect the output of **marshal** to the input of FileClient.**write** and add a business rule; connect the output of **write** to the input of End. See **Figure 74 on page 103**.

7 Open the Business Rules Designer and add the following transformation mappings:

A For **notify**-to-**marshal**: Open...Output >..._notification >...**Typeset** on the left and...Input > OTD5 > **Element** on the right and then map as follows: Result_1 to Field1; Result_2 to Field2; Result_3 to Field3; Result_4 to Field4; and Result_5 to Field5. See Figure 79.

**Figure 79** Mapping OTD5.unmarshal.Output to ddnReports.add.Input




B For **marshal**-to-**write**: Open both sides and then map the...Output **contents** element to the...Input.**text** element.

8 In the toolbar of the BP Designer, click **Validate Business Process Model**.

The bpAlertBelowMinimum model is valid except for unused Fault attributes.

## 8.2.9 Creating and Configuring the Connectivity Map

In the Connectivity Map you create, **cmCars**, you connect instances of all the components in your project and configure the connections. For a preview of the result, see **Figure 80 on page 108**.

### To create the Connectivity Map

1 In the project tree, right-click prjCars and, on the pop-up menu, point at **New** and click **Connectivity Map**.

The Connectivity Map Editor appears.

2 Rename the new Connectivity Map to **cmCars**.

3 From the tool palette, drag six instances of the File external onto the canvas, naming them as follows:

- **fileInCarDefs** (on the far left)
- **fileInReports** (on the far left, just below the preceding)
- **fileInTriggerDelete** (on the far left, just below the preceding)
- **fileInQryExtract** (on the far left, well below the preceding three)

- **fileOutQryExtract** (on the far right, at the same level as the preceding)
- **fileOutAlertBelowMinimum** (on the far right, above the preceding)

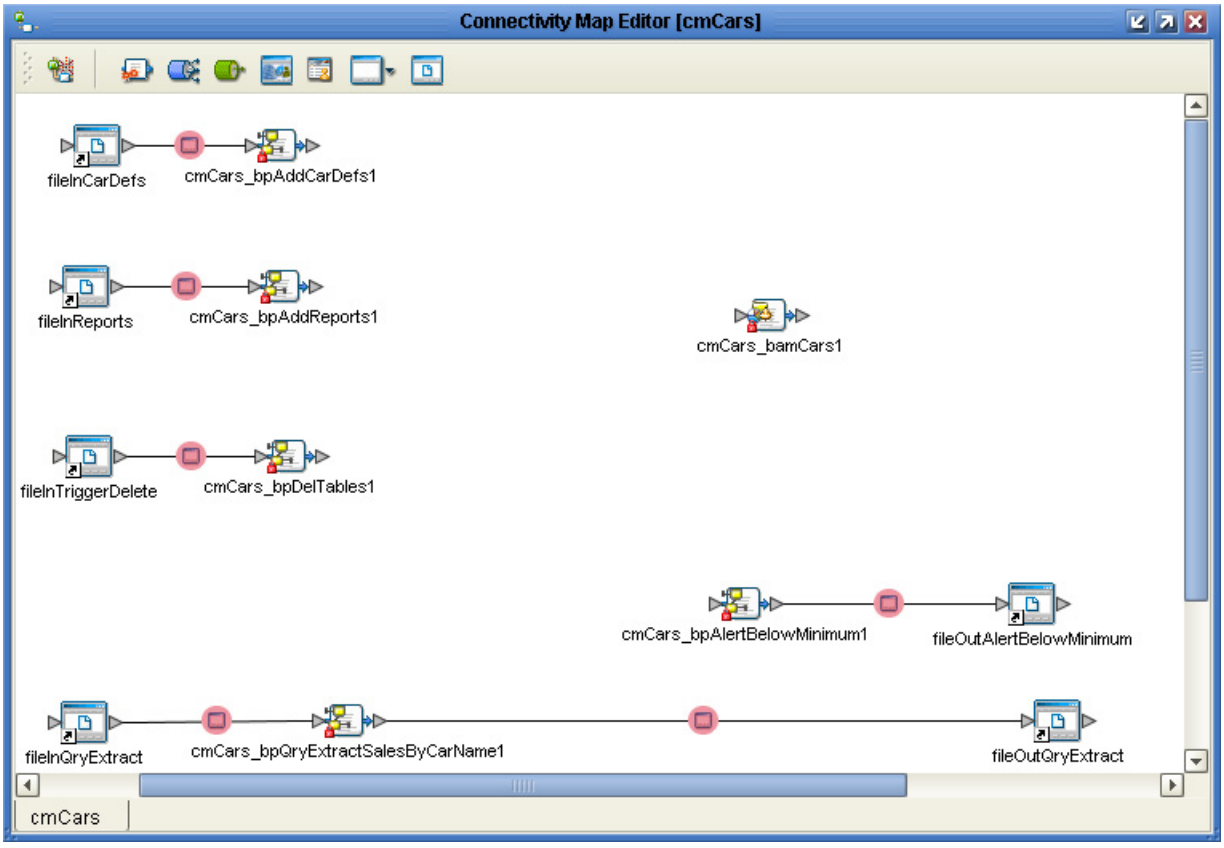
4 From the project tree, drag the following five BPs onto the canvas:

- **bpAddCarDefs** (just to the right of fileInCarDefs)
- **bpAddReports** (just to the right of fileInReports)
- **bpDelTables** (just to the right of fileInTriggerDelete)
- **bpQryExtractSalesByCarName** (just to the right of fileInQryExtract)
- **bpAlertBelowMinimum** (just to the left of fileOutAlertBelowMinimum)

5 From the project tree, drag the eBAM application itself (bamCars) to the center of the map.

6 Connect the external file components as shown in Figure 80.

**Figure 80** Connectivity Map for Sample




Before you can build your application, you must configure the File eWays. (You do not need to worry about the directory paths where input is read and output is written, since you configured the extFileBam external already, in the **procedure on page 75**.)

### To configure the eWays in the Connectivity Map

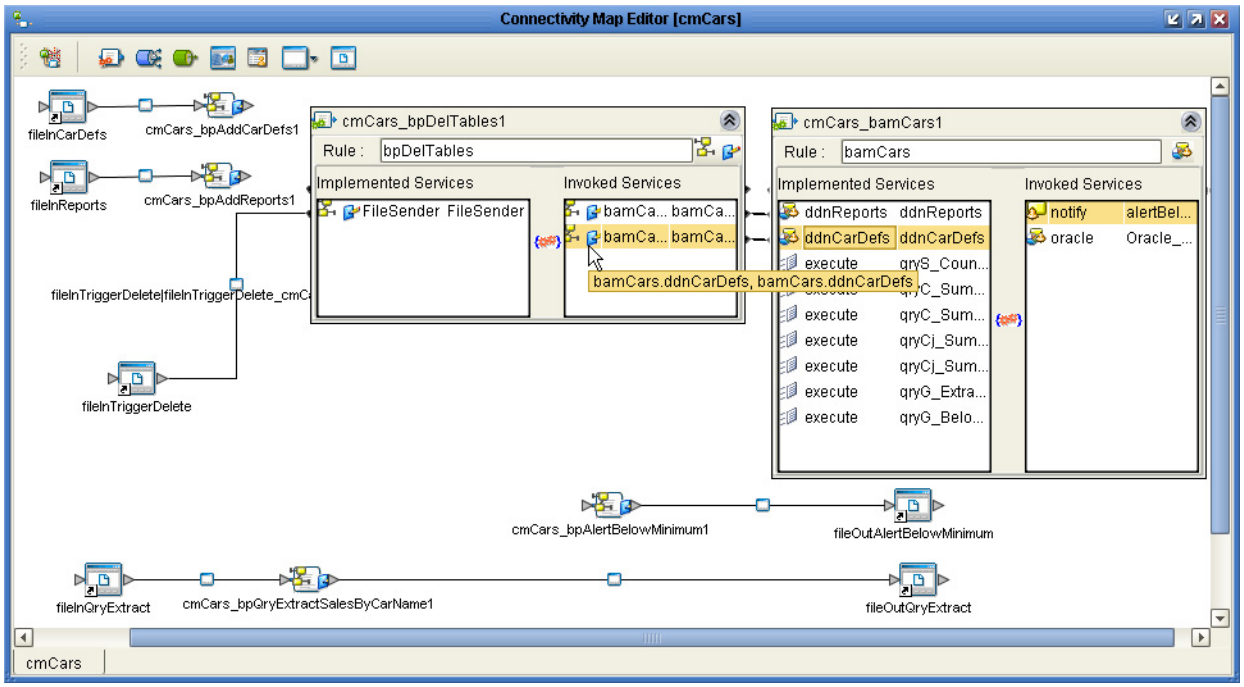
1. In the Connectivity Map Editor, double-click each inbound eWay connecting fileIn* to cmCars_bp* and ensure the following parameters are set correctly:
   - **Input file name** should be as follows:
     - for fileInCarDefs: **inputCarDefs*.txt**
     - for fileInReports: **inputReports*.txt**
     - for fileInTriggerDelete: **TriggerDelete.txt**
     - for fileInQryExtract: **inputQryName*.txt**
   - **Remove EOL** should be **False**
   - **Multiple records per file** should be **False**
2. Verify that all parameters are correctly set, and then click OK.
3. Double-click each outbound eWay connecting cmCars_bp* to fileOut* and ensure the following parameters are set correctly:
   - **Output file name** should be as follows:
     - for fileOutBelowMinimum: **outputAlertBelowMinimum%d.dat**
     - for fileOutQryExtract: **outputQryNameResults%d.dat**
   - **Add EOL** should be **True**
   - **Multiple records per file** should be **False**
4. Verify that all parameters are set correctly, and then click OK.

   All eWays have been configured. The next step is to link the services between the eBAM application and each of the BPs that communicate with it.

### To link the services in the Connectivity Map

1. In the Connectivity Map Editor, double-click the eBAM application instance (cmCars_bamCars1) to open it, and then double-click the bpDelTables instance (cmCars_bpDelTables1) to open it.
2. Drag the invoked service bamCars.ddnReports onto the implemented service ddnServices, and then drag the invoked service bamCars.ddnCarDefs onto the implemented service ddnCarDefs. See Figure 81.

**Figure 81** Connecting Both Services of bpDelTables to bamCars

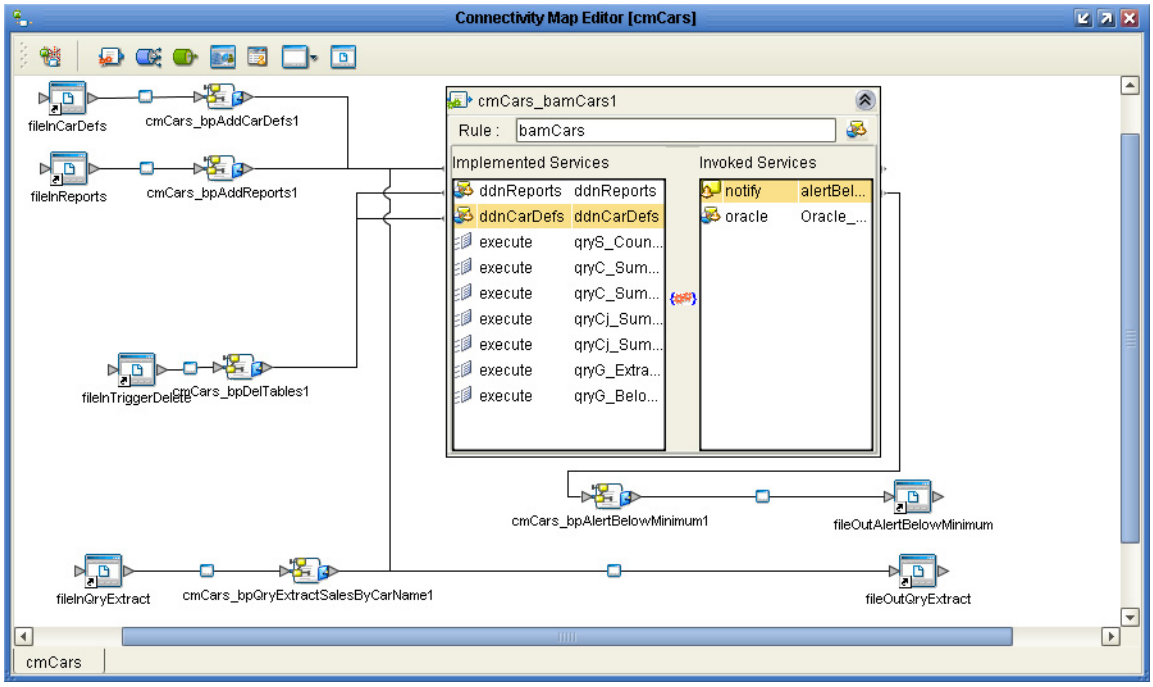



3 Collapse the cmCars_bpDelTables1 instance, and then, one by one, open each of the other three BPs on the left and connect the correct invoked service to the corresponding implemented service in the eBAM application:

- Connect **bpAddCarDefs** (bamCars.ddnCarDefs) to **ddnCarDefs**.
- Connect **bpAddReports** (bamCars.ddnReports) to **ddnReports**.
- Connect **bpQryExtractSalesByCarNames** (...qryG_ExtractSalesByCarName) to **qryG_ExtractSalesByCarName_execute**.

4 From the eBAM application's invoked services, connect the **notify** service to the **cmCars_bpAlertBelowMinimum1** instance. See Figure 82.

**Figure 82** All Connections Completed Between bamCars and BPs




5 Save your work and close all canvases.

sAll parameters have been configured. The next step is to start a domain (if you have not already done so), and then to create and activate a deployment profile for the project.

### 8.2.10 Starting the Domain to Run the Sample

These steps assume you have already created a domain named **domain1** that is started by a script named **start-domain1**.

**To start the domain via command line**

- Open a command prompt and change directories to the location of your logical host. Then start the domain using appropriate parameters. For example:

```
cd <JavaCAPS512>\logicalhost
.\start_domain1
```

As soon as the domain is running, it is ready to have a project deployed to it.

## 8.3 Building, Deploying, and Monitoring the Project

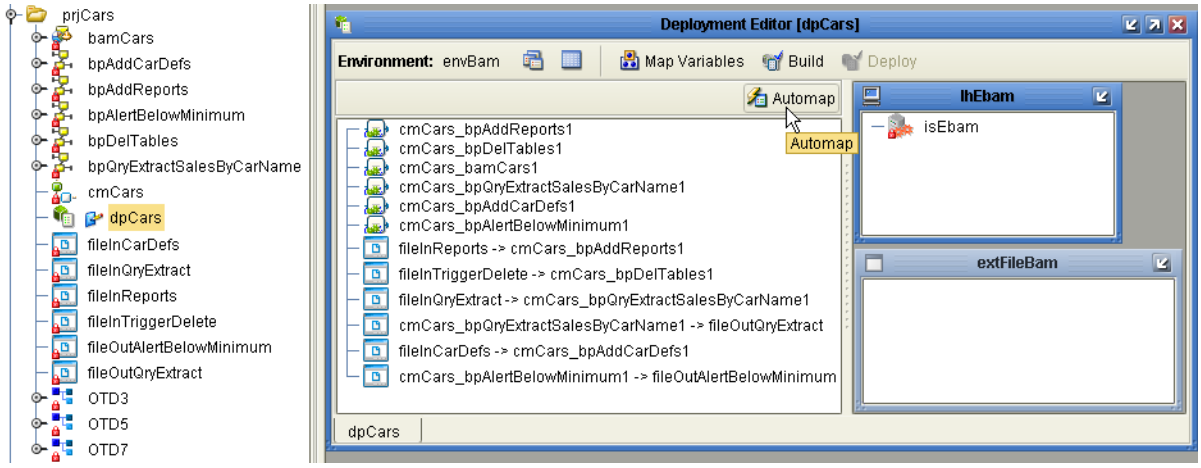
After the data definitions, two charts, and an alert condition are set up, you are ready to see the chart viewer and how it updates in real time as it receives sample data. You will create a deployment profile named **dpCars**, which you will activate and deploy to the domain that is currently running. (If it is not already running, see **"Starting the Domain to Run the Sample" on page 111**.)

### To create the deployment profile and build/deploy the project

1. In Project Explorer, right-click prjCars and, on the pop-up context menu, point at **New** and click: **Deployment Profile**.
2. In the dialog box, name it **dpCars**, and be sure it references the **envBam** environment and the **cmCars** Connectivity Map before clicking OK.

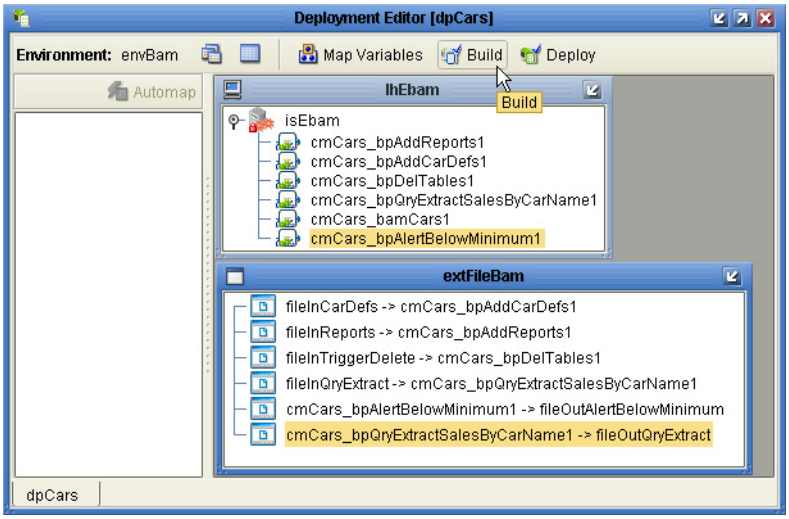
   The project tree displays the new object, and the Deployment Editor shows the components and the servers to which you will assign them. See Figure 83.

**Figure 83** Deployment Profile for Sample, Before Component Mapping



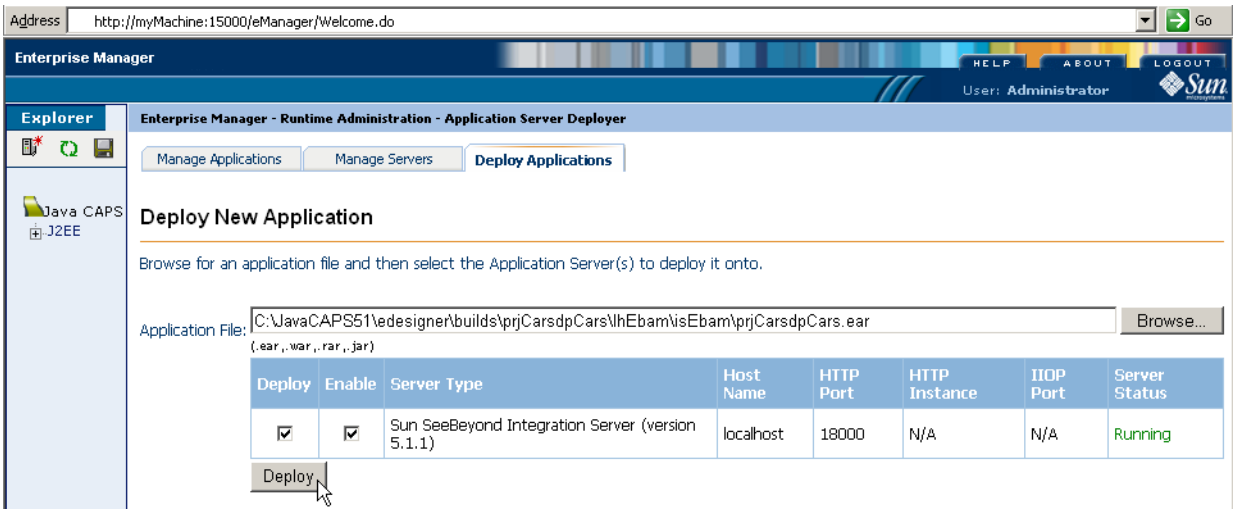

3. To assign the components to their servers, click **Automap**. See Figure 84.

**Figure 84** Deployment Profile for Sample, After Component Mapping




4. To build the project, click **Build**.
5. After the project builds successfully, click **Deploy** and then click **Yes**. Or: Use Enterprise Manager to deploy/enable the project's **.ear** file—**prjCarsdpCars.ear**—in *<edesigner>*\builds\prjCarsdpCars\lhEbam\isEbam\. See Figure 85.

**Figure 85** Using Enterprise Manager to Deploy and Enable the Application




### To start monitoring the project

1. Open a *new* browser session. (Do ***not*** clone a new window from an existing session.)
2. Point your browser at the URL for monitoring the eBAM charts for this project. This takes the following form:

   **`http://`***`Lhname`***`:18001/`***`PrjnameAppinstancenameDpname`***`/`**

   where:

   - *Lhname* is the machine name specified in the Integration Server URL for isEbam. For example: **logicalhost**
   - *PrjnameAppinstancenameDpname* uniquely identifies the deployment profile and eBAM application instance, with underscores stripped out:
     - *Prjname* is the name of the project that contains the deployment profile; for this sample, it is **prjCars**.
     - *Appinstancename* is the instance name of the eBAM application as it appears on the Connectivity Map (but with underscores stripped out); for this sample, it is **cmCarsbamCars1**.
     - *Dpname* is the name of the deployment profile; for this sample, it is **dpCars**.
   - The entire string is case-sensitive, and any underscores must be stripped out; for example, instance name must be **cmCarsbamCars1** (not cmCars_bamCars1).

   Thus, if you have retained all defaults and are running the integration server on your local machine, this is the URLe:

   ```
   http://localhost:18001/prjCarscmCarsbamCars1dpCars/
   ```

   If your integration server is running on another machine, or if it does not use port 18001 for HTTP, then substitute the correct machine name and port in the URL.

   At first, since no data has been fed in, the chart view is blank. Continue with **"Monitoring Key Performance Indicators with Live Data" on page 114**.

# 8.4 Monitoring Key Performance Indicators with Live Data

Now that the data definitions, two charts, and an alert condition are set up, you are ready to see the chart viewer and how it updates in real time as it receives sample data.

## 8.4.1 Adding New Data

In this section, you will feed live data that is constructed to use the **add** services of the two bpAdd* business processes. It will keep existing data and add new records.

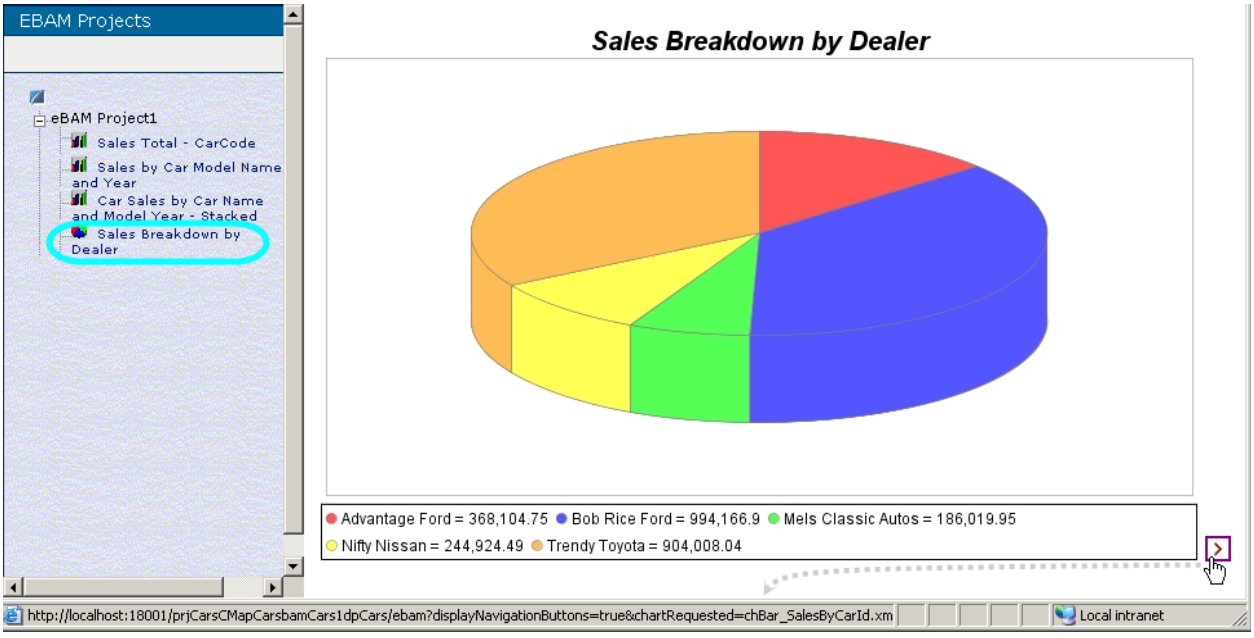
**To add new data and see the accumulated results**

1. Browse (or open a command prompt and change directories) to the location where you installed the sample input data, and verify the presence of sample data files (inputCarDefs.txt.~in, inputReports_all.txt.~in, and so forth). For example:

```
cd C:\temp\eBAM\Sample\Data\In
```

2. Take a copy of **inputReports5_original.~in** and rename it to **inputReports001.txt**, and then watch as the file is picked up and renamed to **inputReports001.txt.~in**
3. In the Charts Viewer, if you have not already done so, click the pie-chart item (the fourth link in the tree, labeled **Sales Breakdown by Dealer**. *Result:* See Figure 86.

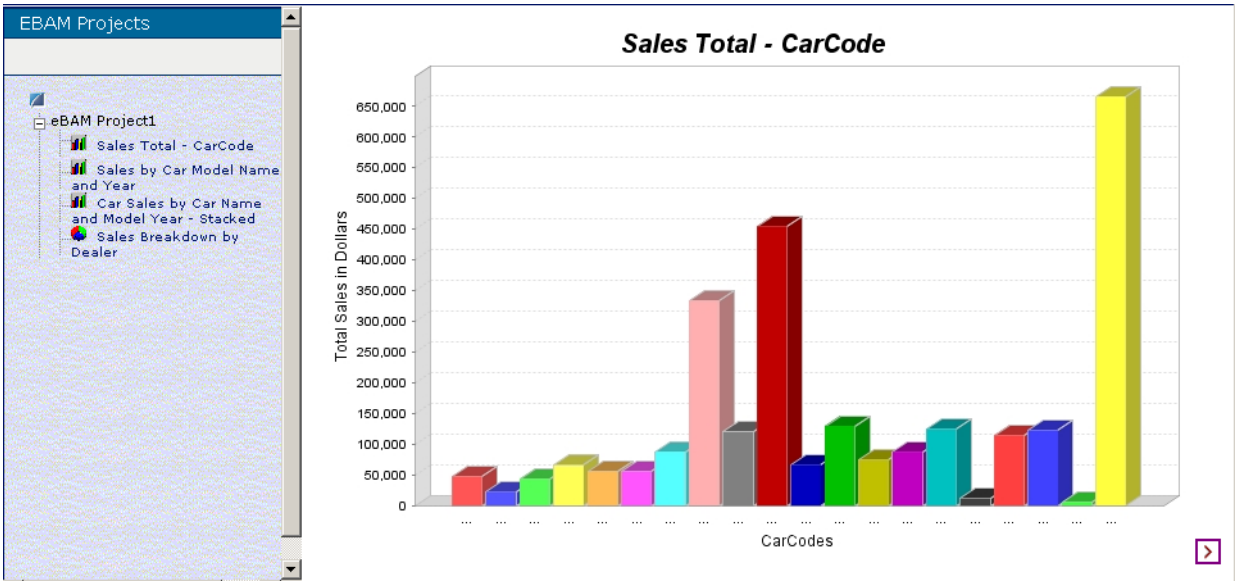
**Figure 86** Pie Chart Showing Car Sales Breakdown by Dealer




**Note:** *Your charts may look somewhat different from these illustrations, if you modified chart properties such as* ***Title***, ***Include Legend***, *and so forth.*

4. In the right pane, below the chart, click the right-pointing chevron [>] link to navigate to the next chart. *Result:* See Figure 87.

**Figure 87** Bar Chart Showing Sales Totals by Car Code




5 In the left pane, click the other two charts to see that they do not yet have data. (Remember that these two charts use queries with joined data definitions.)

6 Take a copy of **inputCarDefs7_original.~in** and rename it to **inputCarDefs001.txt**, and then watch as the file is picked up and renamed to **inputCarDefs001.txt.~in**; then repeat step 5 and see that the charts are now populated. Compare the stacked and unstacked visual representations of the same data.

7 See the effect of feeding in additional data from a modified input file. For example, edit a copy of **inputReports001.txt.~in** and delete the four lines for "Bob Rice Ford". Save the modified file as **inputReports_noBobRice.txt** and, after the file is read, see how the charts indicate the decreased sales and market share for Ford. After this, try the same operation again with different numbers.

## 8.4.2 Deleting Existing Data

In this section, you will delete all data previously written. This exercises the **delete** logic of the bpDelTables process.

### To update existing data using input that contains full data

1 Browse (or open a command prompt and change directories) to the location where you installed the sample input data. For example:

```
dir C:\temp\eBAM\Sample\Data\In
```

2 Take a copy of **TriggerDel_original.~in** and rename it to **TriggerDelete.txt**, and then watch as the file is picked up and renamed to **TriggerDelete.txt.~in**

3 In the Charts Viewer, verify that all charts have lost data and gone dim.

## 8.4.3 Sending Alerts and Notifications

In this section, you will trigger a business process that writes an alert to a file. This exercises the **notify** logic of the bpAlertBelowMinimum process.

### To trigger a notification condition

Before you begin: If you have stale data, delete it. (See **"Deleting Existing Data" on page 115**). In the Charts Viewer, verify that all charts have lost data and gone dim.

1. Browse (or open a command prompt and change directories) to the location where you installed the sample *out*put data. For example:

   ```
   dir C:\temp\eBAM\Sample\Data\Out
   ```

2. Copy the file **outputAlert_comparison.dat** to ...\Sample\Data\In\, rename it to **inputReports_WayShort.txt**, and then watch as the file is picked up and renamed to **inputReports_WayShort.txt.~in**.

   This file contains data reporting unrealistically low car sales—so low as to fall below the $1000 threshold set in **"Creating the eBAM Sample Alert" on page 91**, and thus triggering an alert notification.

   *Result 1:* The display in the Chart Viewer changes to reflect the updated data.

   *Result 2:* A new file, named **outputAlertBelowMinimum1.dat**, eventually appears in the output directory, with contents that echo the current total sales. For as long as the KPI remains below the threshold, alert notifications are re-issued at regular intervals.

## 8.4.4 Using a Dynamic Query

In this section, you will provide a keyword (in this case, a car model name) that is used to filter the data.

*Before you begin:* Populate all charts with realistic data: Rename **inputReports001.txt.~in** to **inputReports001.txt** and rename **inputCarDefs001.txt.~in** to **inputCarDefs001.txt**.

### To execute a dynamic query

1. Browse (or open a command prompt and change directories) to the location where you installed the sample input data. For example:

   ```
   dir C:\temp\eBAM\Sample\Data\In
   ```

2. Take a copy of **inputQryName_original.~in** (contains the single word "Camry") and rename it to **inputQryName_Camry.txt**, and then watch as the file is picked up and renamed to **inputQryName_Camry.txt.~in**

3. In the output directory, verify that **outputQryNameResults1.dat** is written out, and that its contents are restricted to data on sales of Toyota Camrys.

4. Open **inputQryName_Camry.txt.~in**, change its contents to "Explorer", and save it as **inputQryName_Explorer.txt**. Then watch as the file is picked up and renamed to **inputQryName_Explorer.txt.~in**

5. In the output directory, verify that **outputQryNameResults1.dat** is written out, and that its contents are restricted to data on sales of Ford Explorers.

Chapter 9

# Using eBAM Charts in Portals

Projects can be set up so that a Sun Java System Portal Server Version 6 (2005Q4) or Version 7 displays your eBAM charts. The material and instructions discussed here assume that you have defined at least one environment that includes a Sun Java Application Server.

**What's in This Chapter**



## 9.1 About Portals and Portlets

A *portal* is a web site that serves as a gateway for web-based services and applications.

A *portlet* is a Java-based web component that runs inside a portal.

*Java Specification Request (JSR) 168* is a standard that ensures interoperability between portals and portlets. You can generate a JSR 168-compliant portlet application in eBAM Studio, and then expose the portlet in Sun Java System Portal Server.

An *inline frame* (iFrame) web application allows portlet simulation by supplying a simple URL; the portal server creates a virtual browser window for displaying the application, but there is no other intercommunication between portal and application.

## 9.2 About Java CAPS Application Files

When you use Enterprise Designer (Deployment Editor, Build button) or a command-line utilty to build a Java CAPS application, an **.ear** file named *<projName><dpName>***.ear** is generated under **<*JavaCAPS512*>\edesigner\builds**. For example, if your project is named **prj2**, deployment profile **dp8**, logical host **lh3**, and Application Server **as81**, it would be **<*JavaCAPS512*>\edesigner\builds\prj2dp8\lh3\as81\prj2dp8.ear**. This **.ear** file

includes a **.war** file named <*projName*><*dpInstanceName*>**.war** (in the example cited, this would be **prj2dp8.war**).

This **.ear** file, or the corresponding **.war** file that it contains, is called an *application file*. Once it is built, it can be *deployed* to an application serve in several different ways.

## 9.3 About Sun Java Portal Server 6 and 7

In Sun Java Portal Server 6, Java CAPS applications must be deployed as simple URL-based inline frames (iFrames). Portal Server 7 allows Java CAPS portlet applications to be deployed either as simple URL-based iFrames or as JSR 168 portlets; however, using the JSR 168 option requires extra steps.

Table 20 explains which procedures are required for which type of deployment.

**Table 20** Procedures for Generating and Deploying Applications to Sun Java Portal Server

| To display eBAM charts on this platform… | … follow these procedures |
|---|---|
| In a web browser | No special steps are required: Build and deploy your Java CAPS project so as to generate an application for any supported integration server or application server, and then open a web browser and point it at the appropriate URL for the deployed eBAM application. For example:<br>▪ http://localhost:18001/ProjnameAppinstancenameDpname/ebam |
| In an iFrame on Portal Server 6 | 1 Build and deploy your Java CAPS project so as to generate an application for Sun Java System Application Server.<br>2 Refer to **"Running eBAM Studio Applications with Portal Server 6 2005Q4" on page 122**. |
| In an iFrame on Portal Server 7 | 1 Build and deploy your Java CAPS project so as to generate an application for Sun Java System Application Server.<br>2 Follow the steps in **"Setting Up an IFrame Channel" on page 146**. |
| In a JSR 168 portlet on Portal Server 7 | **Be sure you meet the requirements described in "Running eBAM Studio Applications with Portal Server 7" on page 145. In particular, be sure you have reviewed the Release Notes for Portal Server 7 and that you have installed any patches that it indicates are required.**<br>3 Build and deploy your Java CAPS project so as to generate an application for Sun Java System Application Server.<br>4 Follow the steps in **"Setting Up a JSR 168 Portlet Channel" on page 151**. |

# 9.4 Using Sun Java System Portal Server

Sun Java™ System Portal Server delivers capabilities and components necessary for advanced portal solutions. Using Portal Server, you are able to access and find relevant applications and information and personalize your portal environments to best meet your needs.

### Portal Server Benefits

Portal Server's major benefits include:

- Aggregation
- Personalization
- Security, including single sign-on (SSO)
- Collaboration and Communities
- Secure remote access
- Mobile access
- Search
- Content management and delivery
- You can refer to Sun's Portal Server Web site for information on additional available features at the following URL:

  http://www.sun.com/software/products/portal_srvr/index.xml

  See also **Reference Documentation** on page 120.

These benefits and their related features securely deliver the Portal Server capabilities that you require. The overall result is that you can work more efficiently and flexibly, doing a variety of business-related activities, for example, allowing:

- Employees to collaborate
- Sales personnel to access and update customer information on the road
- Partners to get advance access to the latest product designs

### Portal Server and the Java CAPS

You can integrate Portal Server with the Java CAPS, which supports the following Portal Server releases:

- Version 6 2005Q4
- Version 7

Portal Server is part of the Sun Java Enterprise System (Java ES). Use Portal Server Version 6 2005Q4 when deploying on a Windows platform. Use Version 7 for all other platforms.

The rest of this section explains operations you need to perform to allow Portal Server to work seamlessly with eBAM Studio applications.

## 9.4.1 Reference Documentation

This section provides general information on Portal Server features and procedures relevant to the Java CAPS. For more information on Portal Server, Java ES, and Sun Java System Application Server, you can refer to the appropriate Sun Microsystems documentation.

You can use the Documentation Web site's Search feature, located in the upper right corner of the page, to find the appropriate documentation. This feature allows you to search by a variety of methods, for example, document title, key word, or product name.

### Sun Documentation Web Page for Portal Server 6 2005Q4

To access Portal Server 6 2005Q4 and related documentation, see the following Sun Web page:

http://docs.sun.com/app/docs/coll/1293.1

Scroll down the page to find the product documentation.

You can also use this Web page as a convenient list of the Portal Server-related applications and systems. The following information helps you navigate this Web page:

- Because Portal Server operates with Java ES, its documentation is integrated with the suite of user's guides for Java ES.
- This documentation set includes installation instructions for overall Java ES, including all its component products, such as Sun Java System Application Server, and Portal Server.

### Sun Documentation Web Page for Portal Server 7

To access Portal Server 7 and related documentation, see the following Sun Web page:

http://docs.sun.com/coll/1303.1

You can also use this Web page as a convenient list of the Portal Server-related applications and systems. The following information helps you navigate this Web page:

- This documentation set includes installation instructions for overall Java ES, including all its component products, such as Sun Java System Application Server, and Portal Server.
- This documentation set includes a technical note on integrating Portal Server with Java CAPS. See **Necessary Patches** on page 121 for details.

## 9.4.2 Before Installing Portal Server

Before you install Portal Server, ensure that:

- eGate Integrator and eBAM Studio (and any related applications, as needed) are installed and operational.
- You have installed the necessary patches for Portal Server and Java CAPS.

- You have created or imported at least one Project for eBAM Studio using Enterprise Designer; not necessary but recommended.
- You have read the eBAM Studio **Readme.txt** file for information on pre-installation requirements, for example, patches or Portal Server prerequisites.

For complete instructions on how to create and/or import a Project, using Enterprise Designer, see the *eGate Integrator User's Guide*.

## Necessary Patches

You must install patches for your system, to ensure the proper operation of Portal Server. These patches are necessary to:

- Allow Portal Server to operate correctly with Java CAPS.
- Allow Java CAPS to operate correctly with the Sun Java System Application Server version 8.1 UR2 (Patch 8 EE).

The patch you need depends on your operating system. You can access the patches directly from SunSolve Online. The URL for SunSolve is:

http://www.sunsolve.sun.com

For example, at the time this document was being readied for publication, the following patches were current:

- **For Portal Server 7:**
  - Solaris-SPARC — 121913-01
  - Solaris-i386 — 121914-01
  - Linux — 121915-01
- **For Sun Java System Application Server 8.1:**
  - Solaris-SPARC — 119166-15 (package-based); or 119169-07 (file-based)
  - Solaris-x86 — 119167-15 (package-based); or 119170-07 (file-based)
  - Linux — 119168-15 (package-based); or 119171-07 (file-based
  - Windows XP — 122848-01 (package-based); or 119172-07 (file-based)

Because patches are frequently revised or superseded, do not install any patch until you have checked that it is the latest available.

You can find specific information on locating and accessing these patches as follows:

- **Portal Server**: See the Portal Server technical note "Integrating Java CAPS With Sun Java System Portal Server." This technical note provides the patch numbers you need to search for these patches on SunSolve. You can find this technical note at the following URL:

  http://docs.sun.com/source/819-6117/index.html
- **Sun Java System Application Server**: See the main Java CAPS **Readme.txt** file, which provides the patch numbers you need to search for these patches on SunSolve.

### Portal Server 6 2005Q4 and Portal Server 7

Regardless of whether you install Portal Server 6 2005Q4 or Portal Server 7, all other related systems and applications are compatible with both Portal Server versions (see the list on the Web page cited under **Sun Documentation Web Page for Portal Server 6 2005Q4** on page 120).

### Release Notes and Additional Information

Before you begin installing Portal Server for use with Java CAPS, be sure to read the release notes that accompany the documentation. For general information on how to obtain Portal Server documentation, see **Reference Documentation** on page 120.

It is especially recommended that you read the following documents:

- "Integrating Java CAPS With Sun Java System Portal Server" (see the URL for the Portal Server technical note referenced under **Sun Documentation Web Page for Portal Server 7** on page 120).
- "Sun Java System Portal Server Release Notes for Microsoft Windows, Version 6 2005Q4" at the following URL:

  http://docs.sun.com/source/819-4270/index.html
- *Sun Java System Portal Server 7 Installation Guide*, "Chapter 1: Pre Installation Requirements for the Sun Java System Portal Server 7 Software" at the following URL:

  http://docs.sun.com/app/docs/doc/819-3027

## 9.4.3 Running eBAM Studio Applications with Portal Server 6 2005Q4

This section explains how to set up Sun Java System Portal Server 6 2005Q4 to run with the Java CAPS applications, including eBAM Studio.

### Before You Start

Take care to ensure you have completed the prerequisite actions listed under **Before Installing Portal Server** on page 120.

### System Requirements

You must run Portal Server 6 2005Q4 in:

- Sun Java System Application Server, Version 8.1

If you want to utilize a Windows XP operating system, use this version of Java ES and Portal Server and display your Web interfaces (frames) on eBAM Studio using an IFrame channel.

IFrame channels can reference any URL accessible to your Sun Java System Application Server installation. As a result, eBAM Studio Projects displayed by IFrame do not have to be deployed on the same server as Portal Server.

For more information on supported operating systems, see the **Readme.txt** file that accompanies eBAM Studio.

## Supported Operating Systems

For specific information on all operating systems supported by Portal Server 6 2005Q4 in conjunction with the Java CAPS and eBAM Studio, see the **Readme.txt** file for eBAM Studio.

## Portal Server 6 2005Q4 on Windows: Procedural Overview

This section explains procedures you need to know, to successfully set up eBAM Studio applications to display on Portal Server 6 2005Q4, utilizing IFrames on Windows.

The following list provides an overview of these procedures:

- Configuring the Sun Java System Application Server and Java ES so that Portal Server deploys on the correct application server.
- Deploying eBAM Studio applications to the Sun Java System Application Server.
- Creating users in the Sun Java System Application Server using Access Manager.

**Note:** *For more information on Access Manager, see the following URL:* http://docs.sun.com/app/docs/coll/1292.1

- Creating new IFrame channels using Access Manager.
- Displaying the Portal Desktop.

### Important

The port numbers provided in all access URL examples are the system defaults. The actual port numbers used by your system's configuration may be different. Before you begin using the procedures provided in the rest of this section, make sure you have verified the correct port number for any URL referenced by a given procedure.

### Installing Portal Server 6 2005Q4 to Run in Sun Java System Application Server on Windows

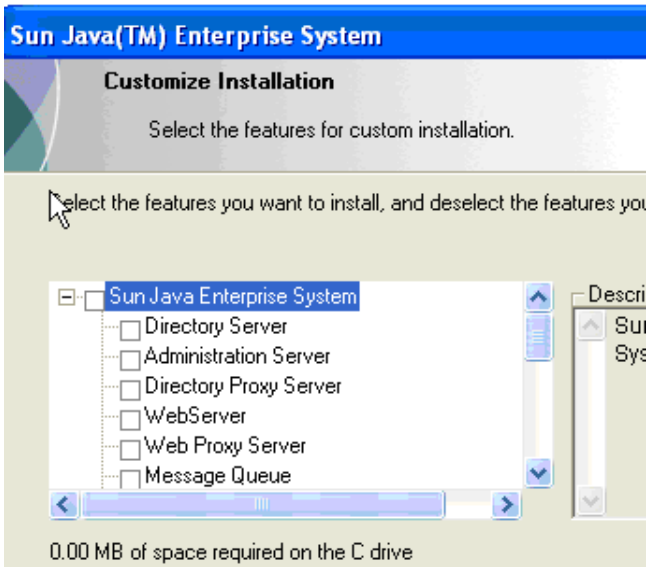
Portal Server 6 2005Q4 uses the Java ES installer and, by default, is configured to run in the Java ES Web Server. You must change this default configuration.

### To install

1. Start the Java ES installer.
2. Choose **Configure Automatically**.
3. Choose the **Custom Installation** option.

The Customize Installation user interface appears. See Figure 88.

**Figure 88** Customize Installation User Interface




4 Deselect **Java ES**. See Figure 88.

5 Select **Sun Java System Application Server**, **Directory Server**, **Access Manager**, and **Portal Server** from the list shown in Figure 88.

Automatically, several other items are selected, including the Java ES Web server, which you do not want installed.

6 Expand **Sun Java System Application Server**; all the boxes are checked by default.

7 Deselect **Load Balancer Plugin**.

8 Make sure that **Web Server** is not selected.

9 Click **Next** to continue.

10 Finish the installation procedure. You are prompted appropriately as other components are needed.

### Important

During the installation, you are asked to create and enter an administrator user name and password. Make sure you keep a record of these exact entries.

### Starting Sun Java System Application Server on Windows

This section explains how to start Sun Java System Application Server and the Node Agent on Windows.

### To Start Sun Java System Application Server and the Node Agent

1 On the Windows **Start > All Programs** menu, choose **Sun Microsystems > Application Server > Start Administration Server**.

A command line window displays, and you are prompted to enter your password.

Whenever you are prompted for your administrator user name and/or password, be sure to use the ones you created during your initial Java ES Portal Server installation.

2 After you enter the password, click **Enter**.

There is no confirmation the password is accepted. Several minutes may pass before the server finishes starting.

3 On the Windows **Start > All Programs** menu, choose **Sun Microsystems > Application Server > Start Node Agent**.

A command line window displays, and you are prompted to enter your password.

4 After you enter the password, click **Enter**.

Again, there is no confirmation the password is accepted. Several minutes may pass before the node agent finishes starting.

### Deploying eBAM Studio Applications

This section explains how to deploy eBAM Studio applications on Sun Java System Application Server.

### To deploy eBAM Studio applications

1 Make sure the Sun Java System Application Server is running.

2 Java CAPS applications require special permissions. Make sure the appropriate permissions have been set up correctly in the **server.policy** file. For more information on permissions in Java CAPS, see the *eGate Integrator System Administration User's Guide*.

3 Deploy the eBAM Studio **.ear** file to the application server on which Portal Server is running. You can do this operation using:

- Enterprise Designer
- Enterprise Manager
- A Sun Java System Application Server's administrator interface, either the Admin Console or the command line

A command-line example follows:

```
./asadmin deploy --user admin /tmp/prj2dp8.ear
```

See the *eGate Integrator User's Guide* and *eGate Integrator System Administration Guide* for details on how to deploy an **.ear** file using Enterprise Designer and Enterprise Manager. See the **procedure on page 126** for information on how to deploy an **.ear** file using Sun Java System Admin Console.

### To access the Application Server Admin Console

1 On the Windows **Start > All Programs** menu, choose **Sun Microsystems > Application Server > Admin Console**.

You can also access this page by entering either of the following URLs, using your Web browser:

- On any machine:

  `https://<host name>:4850/`

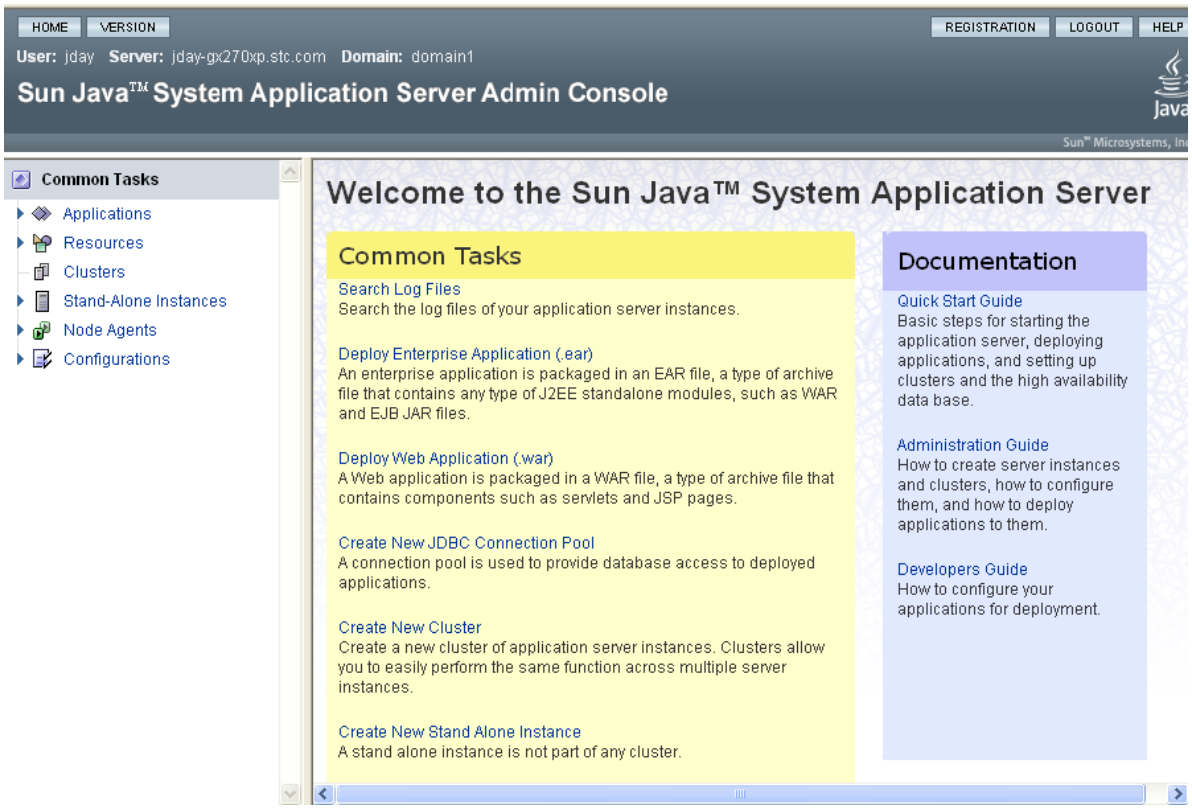
- On your own machine:

  `https://localhost:4850/`

2 In the resulting dialog box, enter your administrator user name and password, and click **Enter**.

The Admin Console page displays. See Figure 89.

**Figure 89** Admin Console Page



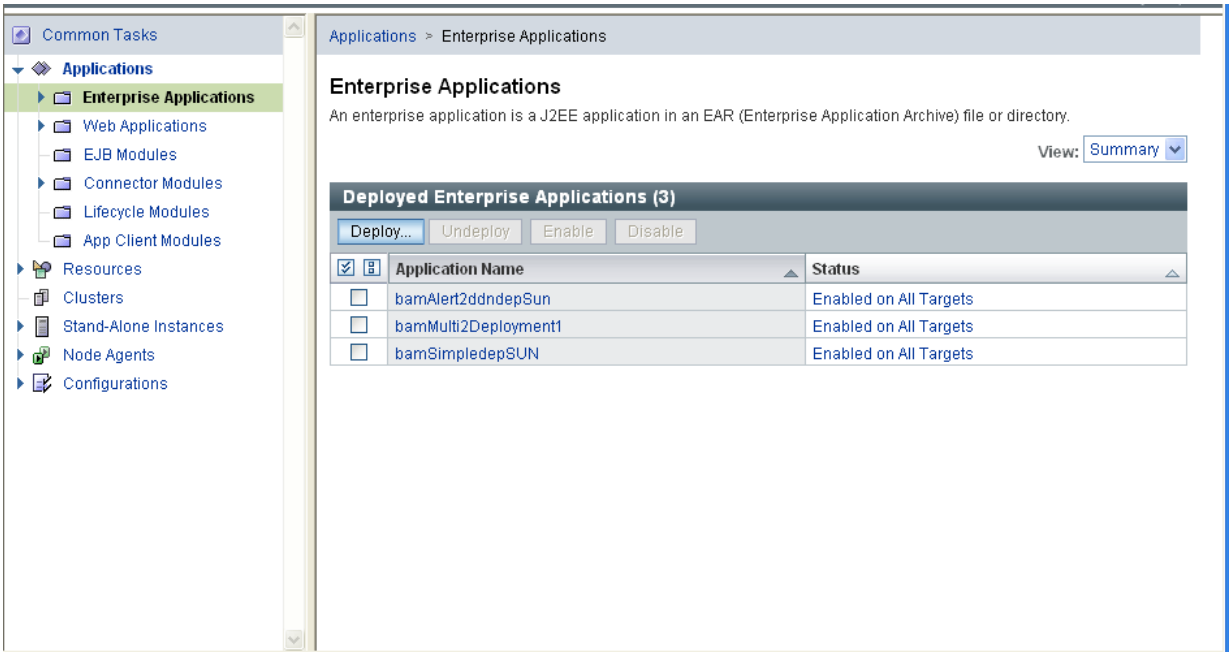

### To deploy eBAM Studio applications using Admin Console

1 On the **Common Tasks** frame (on the left), select **Applications** in the tree, to show the available operations under this option.

2 Select **Enterprise Applications** under **Applications**.

The **Enterprise Applications** frame appears on the right. See Figure 90.

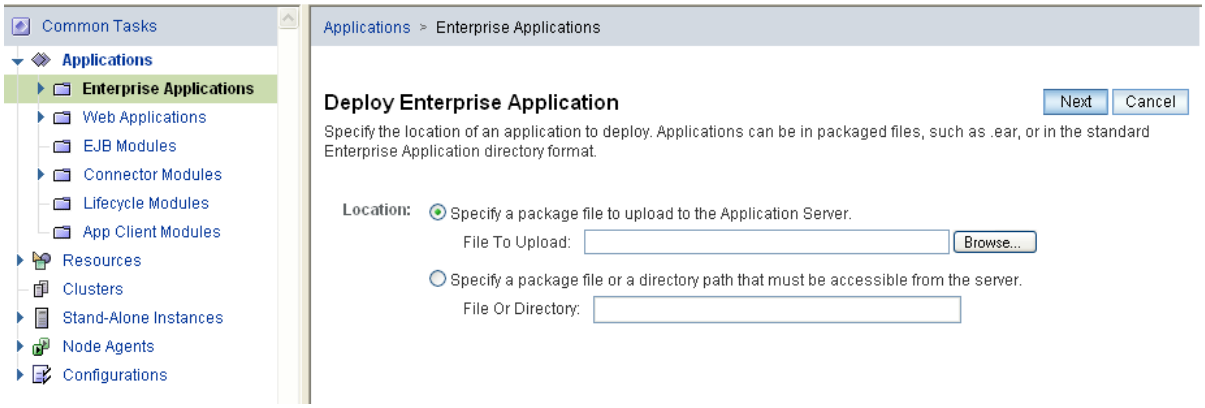
**Figure 90** Admin Console Page With Enterprise Applications Frame




3 Click **Deploy**.

The **Deploy Enterprise Application** frame appears. See Figure 91.

**Figure 91** Deploy Enterprise Application Frame: Initial

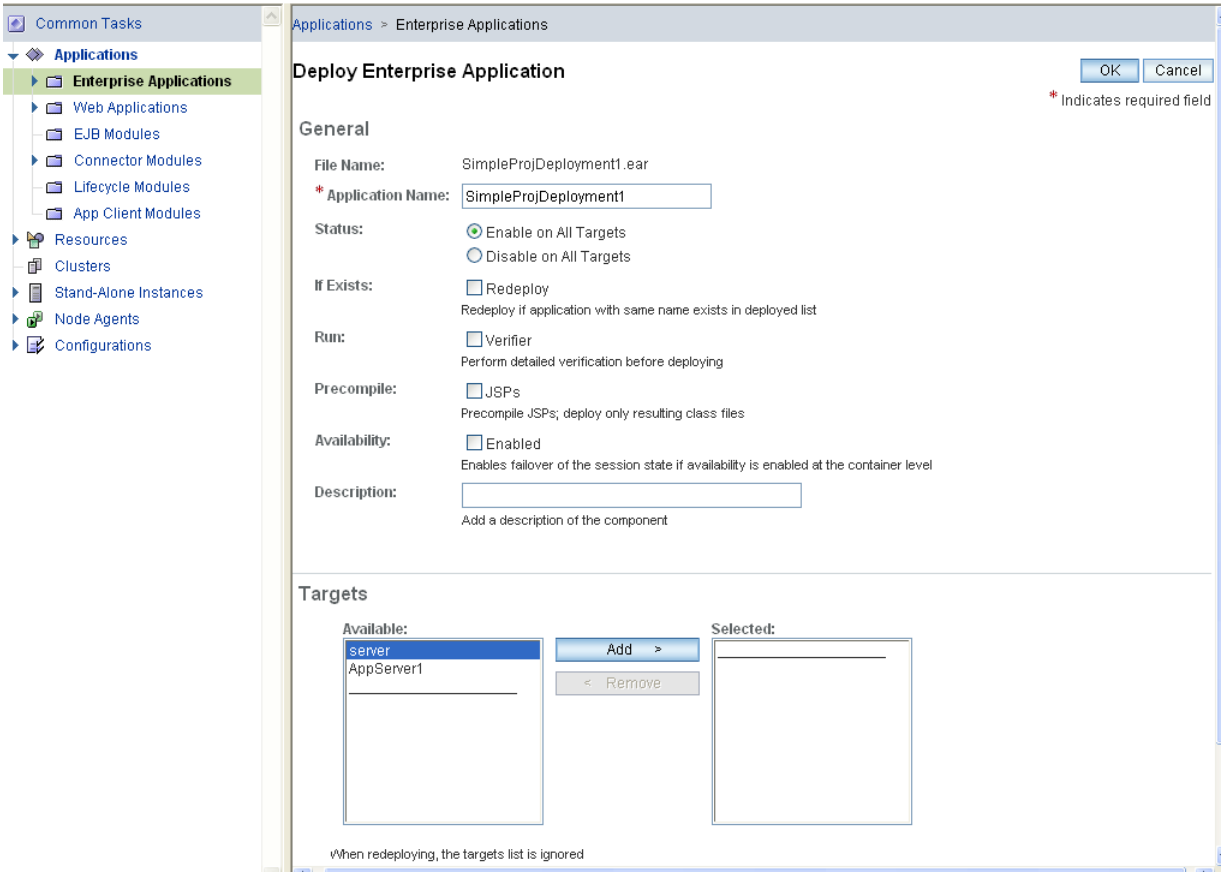



4 Browse to the **.ear** file you generated using Enterprise Designer.

5 Select the file and click **Next**.

The **Deploy Enterprise Application** frame refreshes to display another page, as shown in Figure 92.

**Figure 92** Deploy Enterprise Application Frame: After .ear File Selection




6 Scroll to the bottom of this frame, to **Targets**, if this section is not already displayed.

7 Under **Available**, click **server** then **Add** to move your selected file to the **Selected** column on the right.

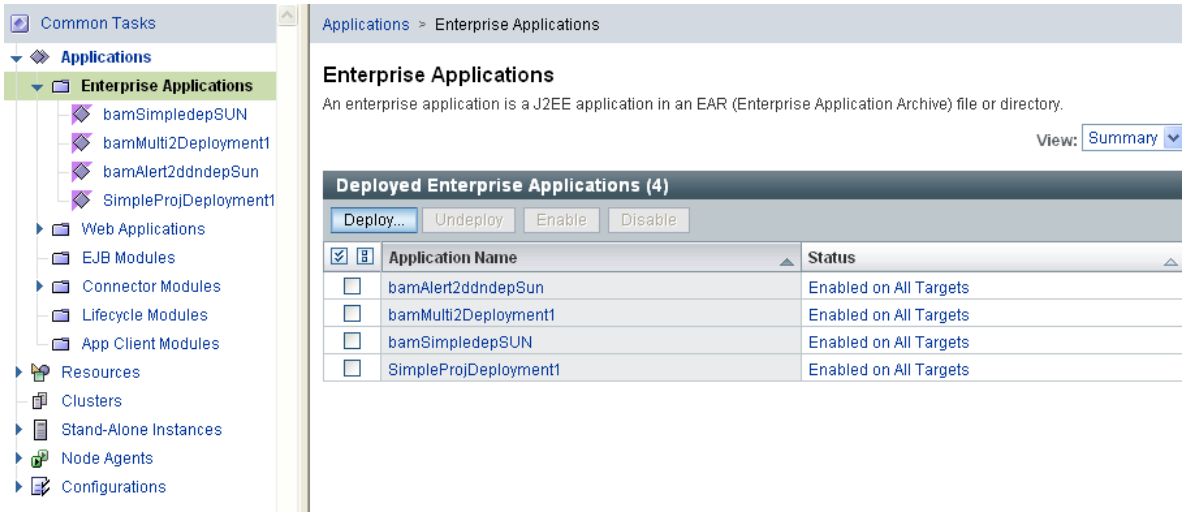
**Note:** *If you have deployed this application before, select the* **Redeploy** *check box.*

8 Click **OK**.

You have now finished deploying the current application. The **Deploy Enterprise Application** frame refreshes to display the initial frame, **Enterprise Applications**.

The name of your application appears in the list of deployed applications on this frame. See Figure 93.

**Figure 93** New Enterprise Applications List




### Creating New Portal Server Users

Use Sun Java System Access Manager to create a new Portal Server user.

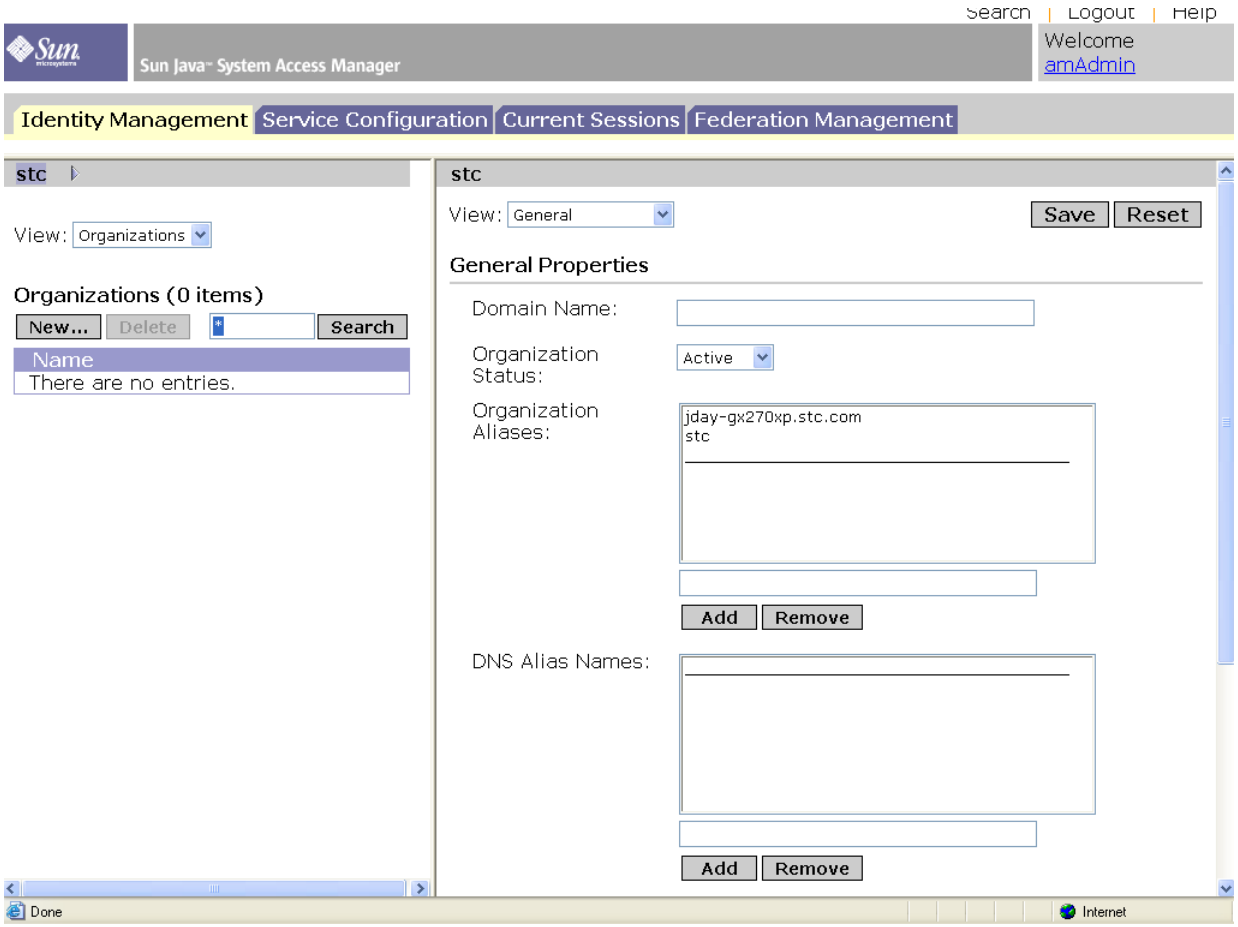
**To view the Access Manager Console page**

1. Perform either of the following operations:
   - On the Windows **Start > All Programs** menu, choose **Sun Microsystems > Access Manager > Administration Console**.
   - Enter the following URL on your Web browser:

     `http://<host name>:38080/amconsole`
2. Use the default user name **amadmin**, and enter your administrator password.
3. Click **Enter**.

The Access Manager Console page appears. See Figure 94.

**Figure 94** Access Manager Console Page




### To create a new user

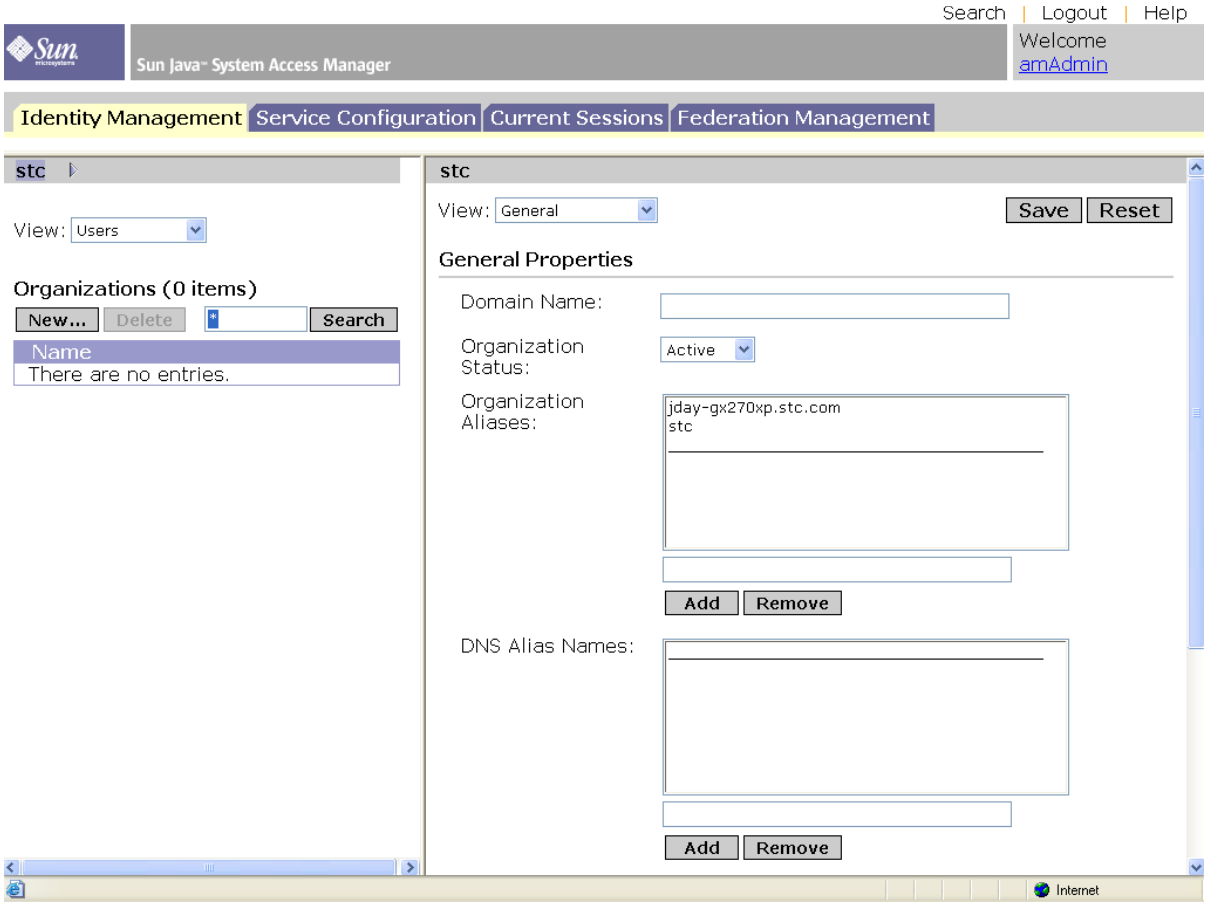
1. On the Access Manager Console page, make sure the **Identity Management** tab content is displayed.

   If there are multiple organizations displayed, choose the organization that has the appropriate permissions for you to use the Portal Desktop.

2. From the **View** drop-down list choose **Users**.

A frame appears on the right, allowing you to edit user properties, as well as create new users. See Figure 95.

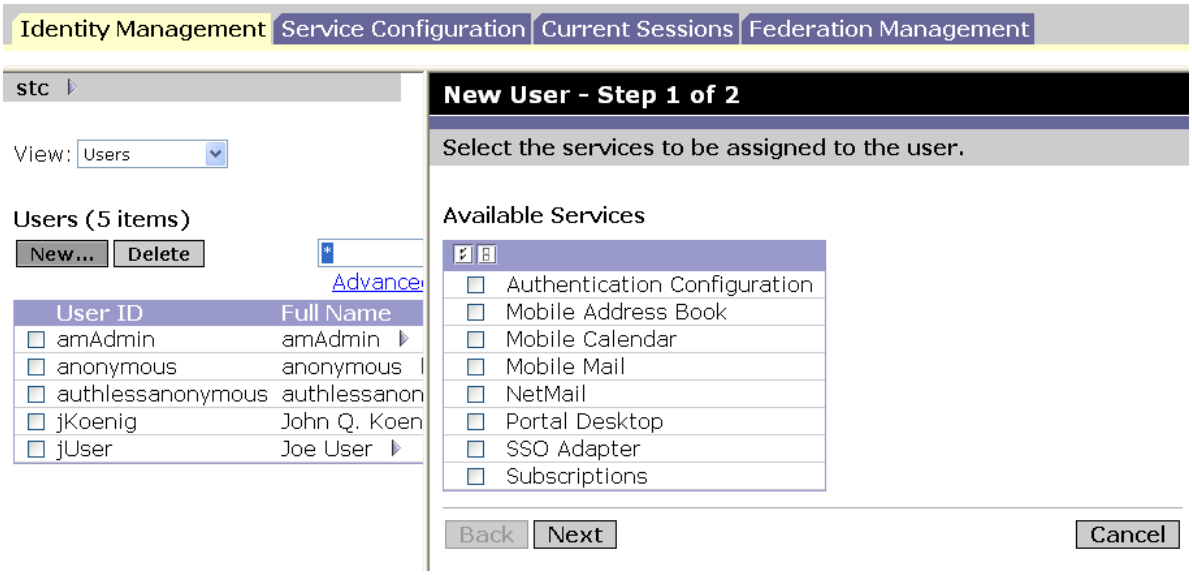
**Figure 95** Access Manager Console With User General Properties




3 Click **New**.

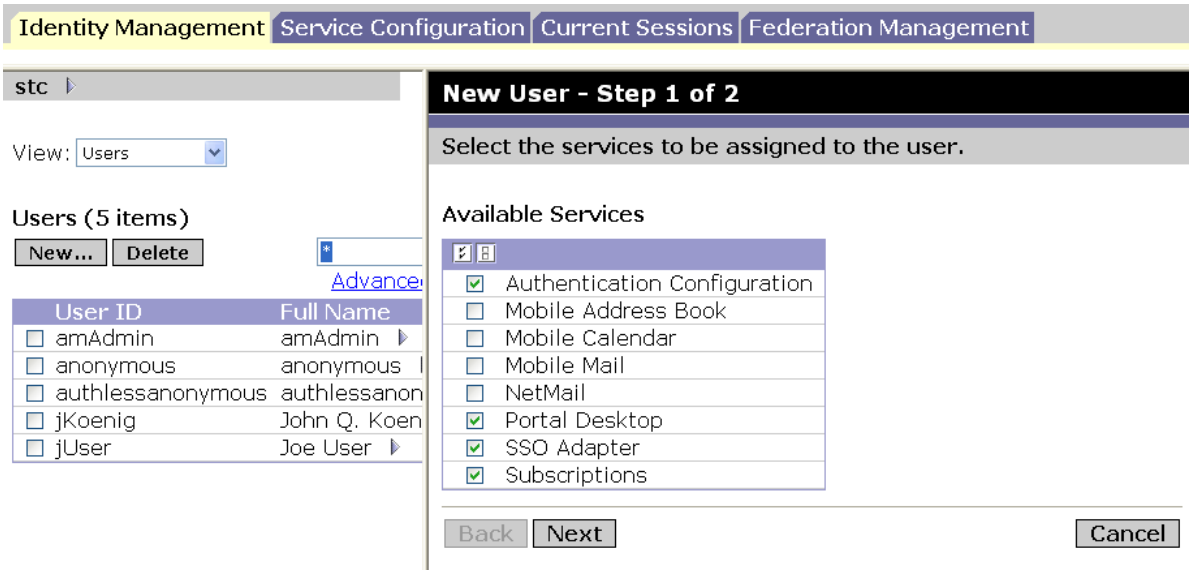
A frame appears, allowing you to select the appropriate services for the new user. The right frame also displays a list of users. See Figure 96.

**Figure 96** Available Services for New User




4 Select the services you want. Be sure to include **Portal Desktop**. For an example, see Figure 97.

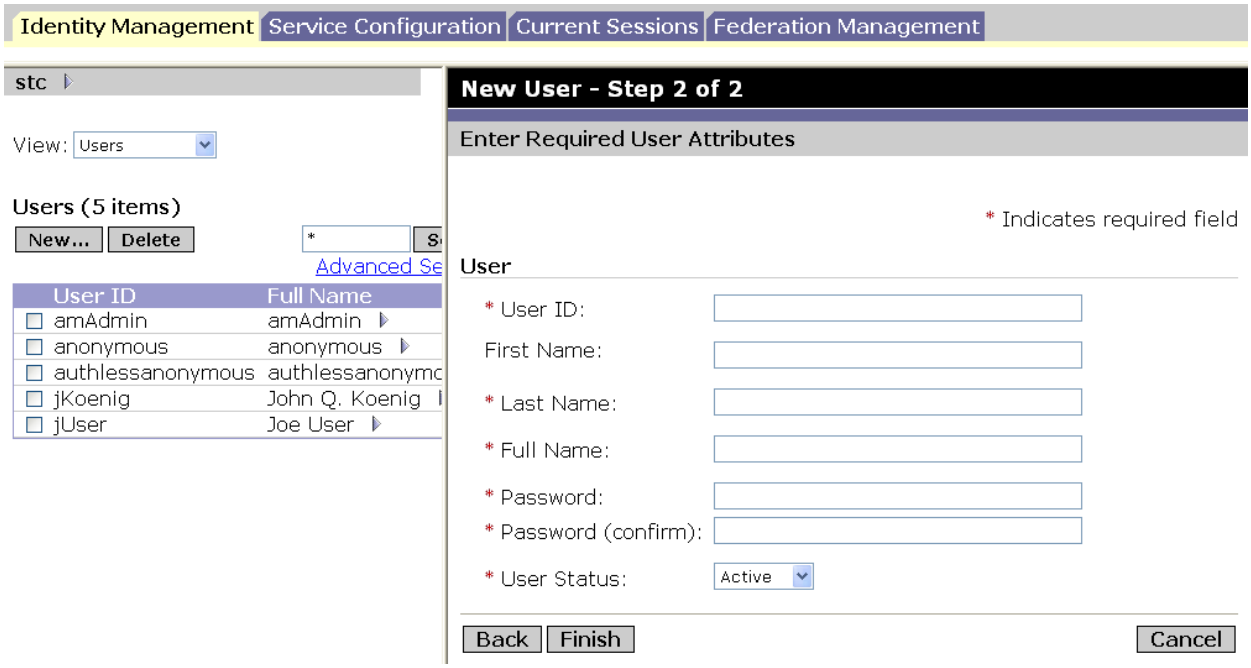
**Figure 97** Available Services for New User List: Selected




5 Click **Next**.

A frame appears, allowing you to enter new user information. See Figure 98.

**Figure 98** Information for New User List




6 Enter the necessary user information and click **Finish**.

You are finished creating the new user. The list of users refreshes and the Access Manager Console page now shows the new user.

### Creating a New Channel

Use Access Manager Console to create a new channel.

#### To view the Access Manager Console page

- Use the **procedure on page 129**.

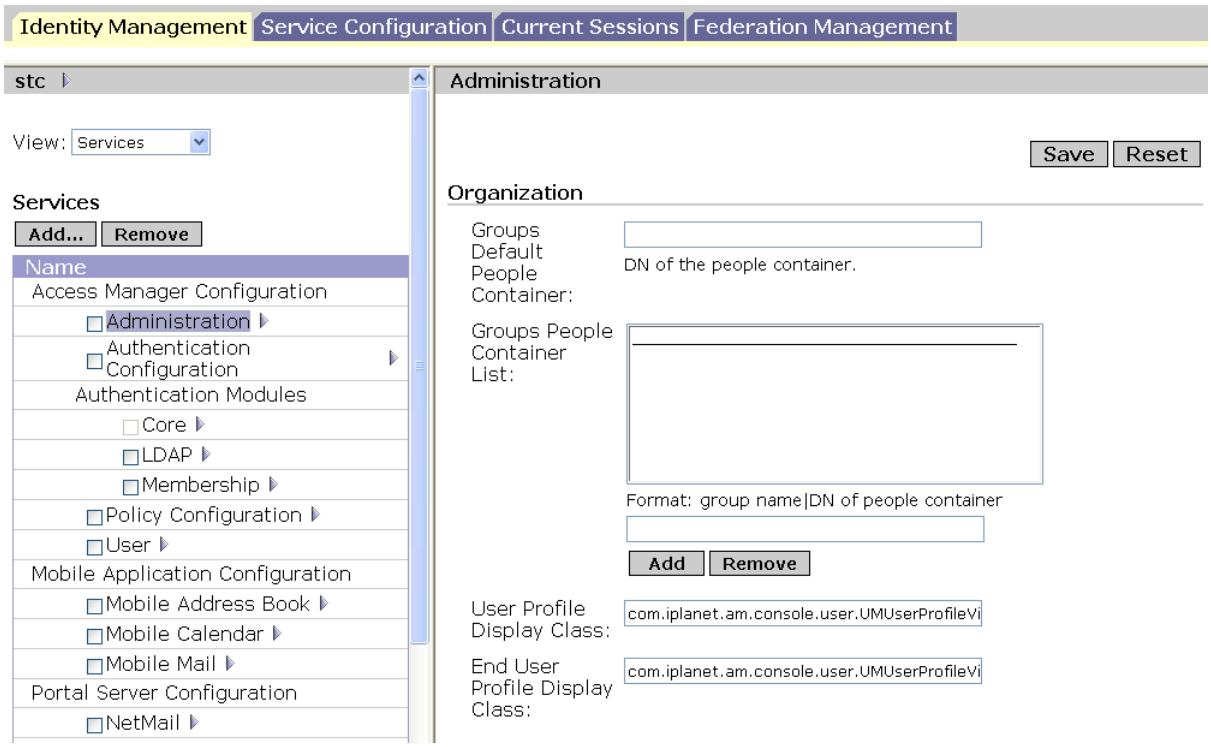
#### To create a new channel

1 On the Access Manager page, make sure the **Identity Management** tab content is displayed.

2 From the **View** drop-down list choose **Services**.

A frame appears on the right, allowing you to manage Portal Server services, under Identity Management. See Figure 99.

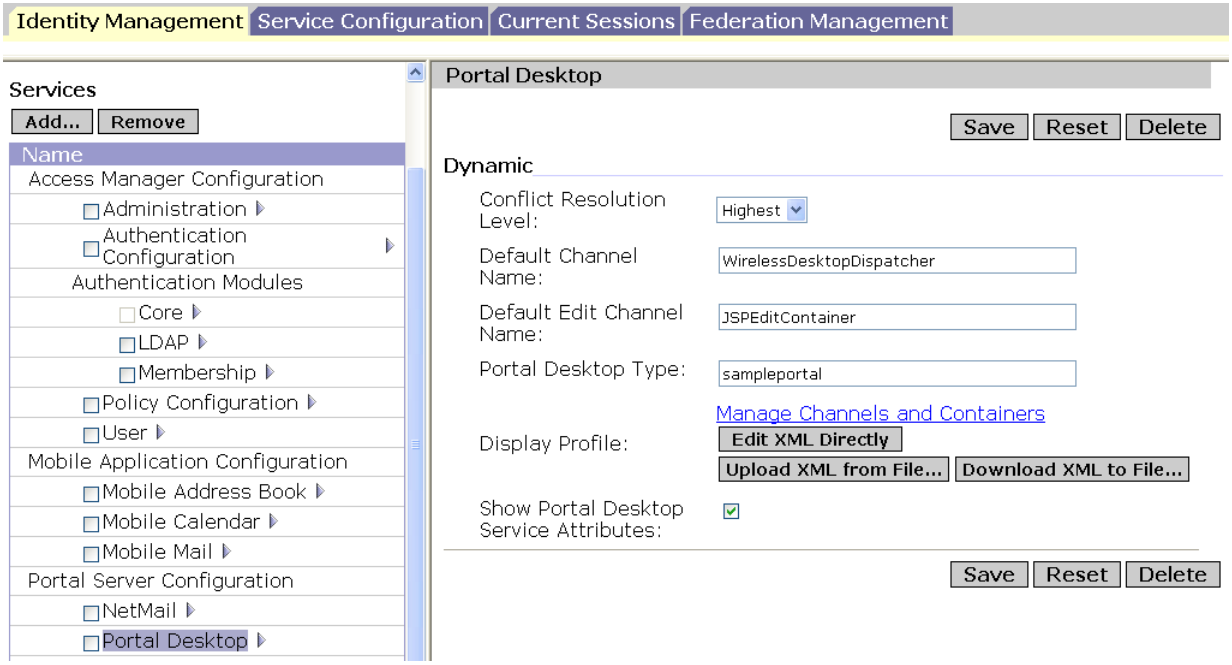
**Figure 99** Initial Window: Portal Server Services (Identity Management)




3 Scroll down the **Services** (left) frame to display the **Portal Desktop** options and click the pointer icon to the right of **Portal Desktop**.

The **Portal Desktop** frame appears on the right. See Figure 100.

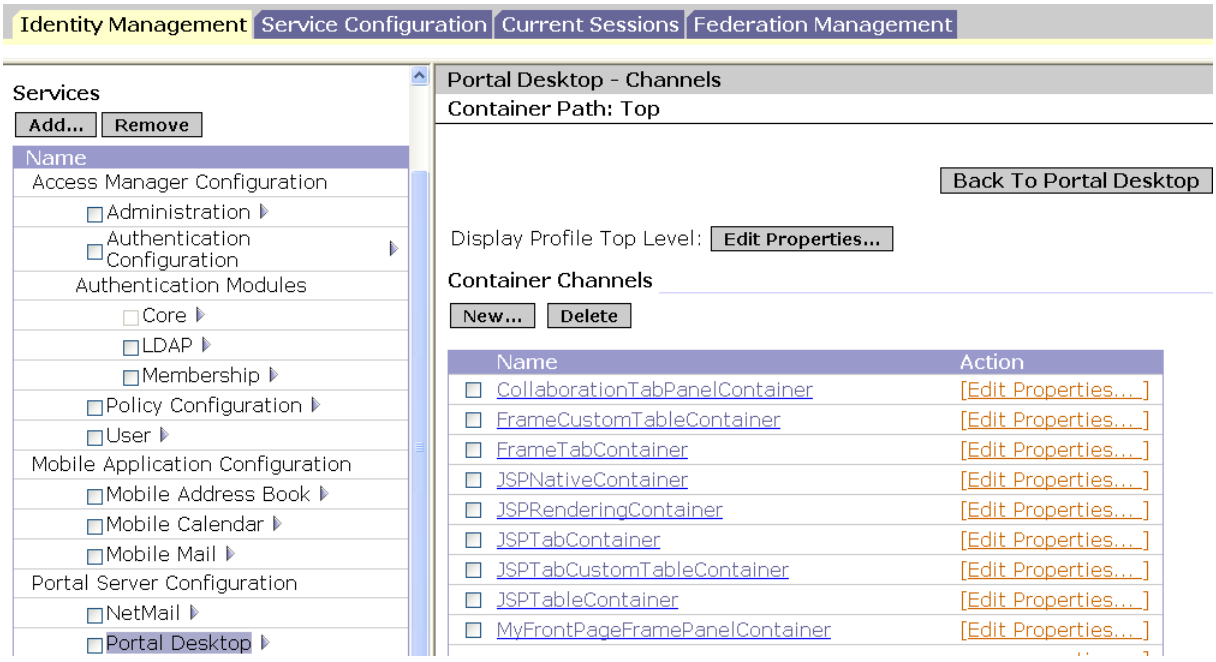
**Figure 100** Access Manager Page With Portal Desktop




4 On the **Portal Desktop** frame, click the **Manage Channels and Containers** link.

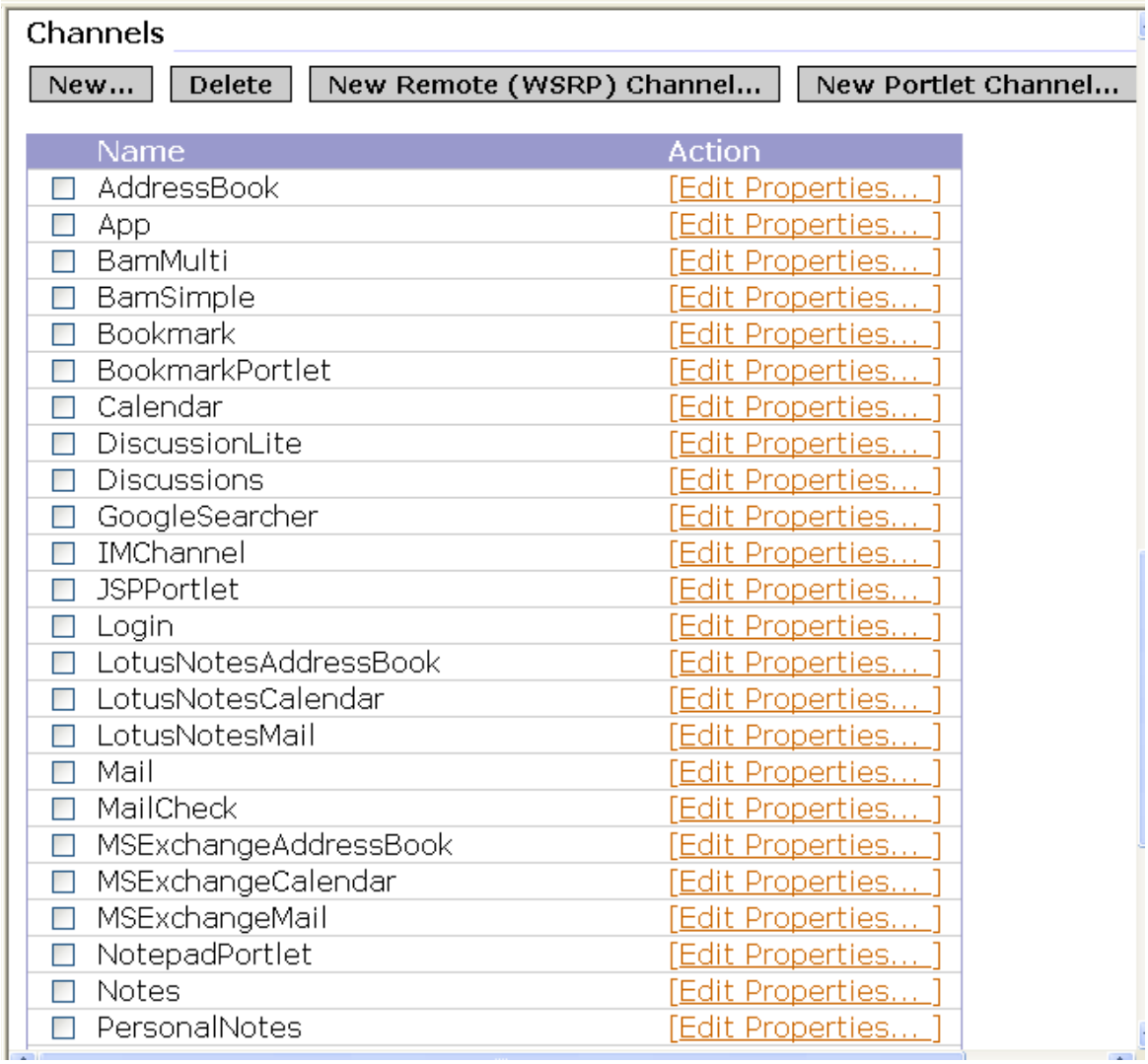
The **Portal Desktop: Channels** frame appears, which allows you to create and edit Portal Desktop channels, along with related features. See Figure 101.

**Figure 101** Access Manager Page: Portal Desktop - Channels



5 Scroll down the **Portal Desktop - Channels** frame to the **Channels** section, which displays a list of existing channels. See Figure 102.

**Figure 102** List of Existing Channels

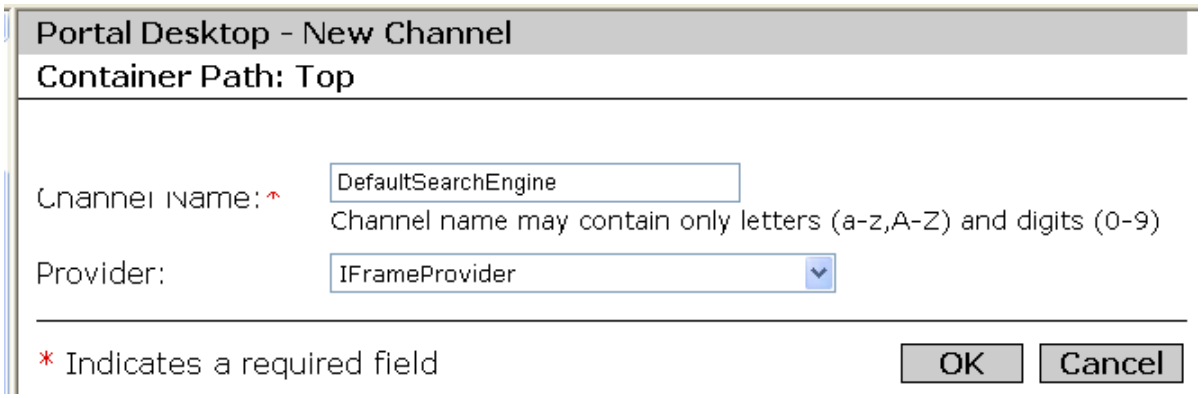



6 Click **New**.

The **New Channel** frame appears.

7 Enter the name of your new channel and choose **IFrameProvider** on the **Provider** pull-down menu. Enter the **Channel Name** of your new channel. In this example, the name **DefaultSearchEngine** is used. See Figure 103.

**Figure 103** New Channel Frame With IFrame Provider




8 Click **OK**.

**Portal Desktop - Channels** frame appears again. See **Figure 101 on page 135**.

9 Scroll down this frame to the **Channels** section again. See **Figure 102 on page 136**

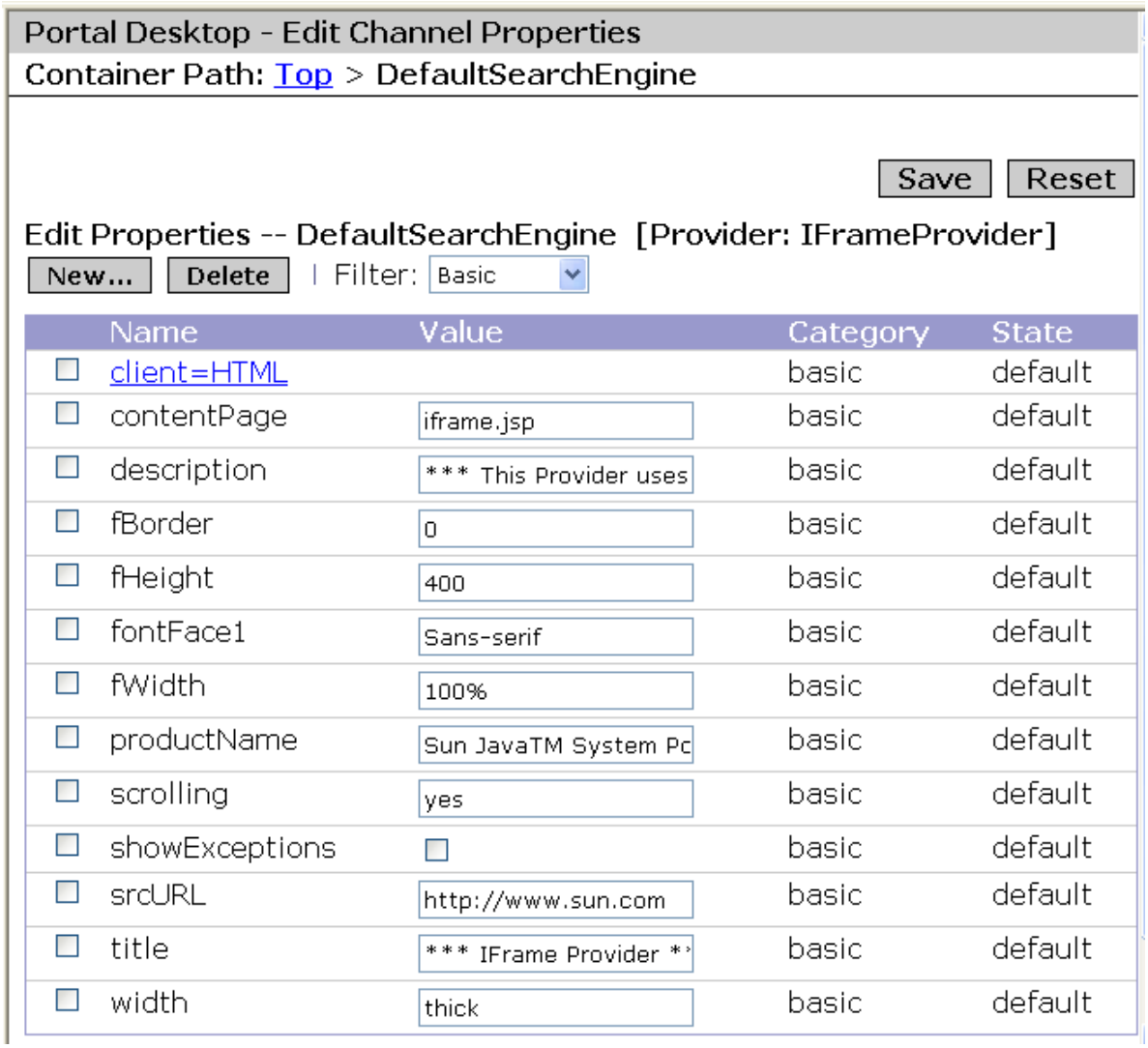
However, the section now contains the name of the new channel you just created.

10 Locate this channel's name. If you used the example shown in Figure 103, the name is **DefaultSearchEngine**.

11 Click the **Edit Properties** link to the right of **DefaultSearchEngine**, or the alternate channel name you entered, if applicable.

The **Edit Properties** frame for the channel appears, displaying the channel's default properties. See Figure 104.

**Figure 104** Edit Properties Frame for New Channel




12 Edit the properties, as necessary. Make sure you enter the appropriate access URL for your new channel, using the **srcURL** text box.

It is recommended that you enter a descriptive **title** property name of your own choosing, to replace the default. This name appears in the new channel's frame title bar.

13 Click **Save**.

Your new channel is now ready to be placed on the Portal Desktop. See **Placing a New Channel Into a Portal Desktop Tab** on page 139 for an explanation of how to associate a channel with a tap on the Portal Desktop.

### Placing a New Channel Into a Portal Desktop Tab

Use Access Manager Console to place a new channel into a tab on the Portal Desktop.

#### To view the Access Manager Console page

- Use the **procedure on page 129**.

#### To place a channel on the Portal Desktop

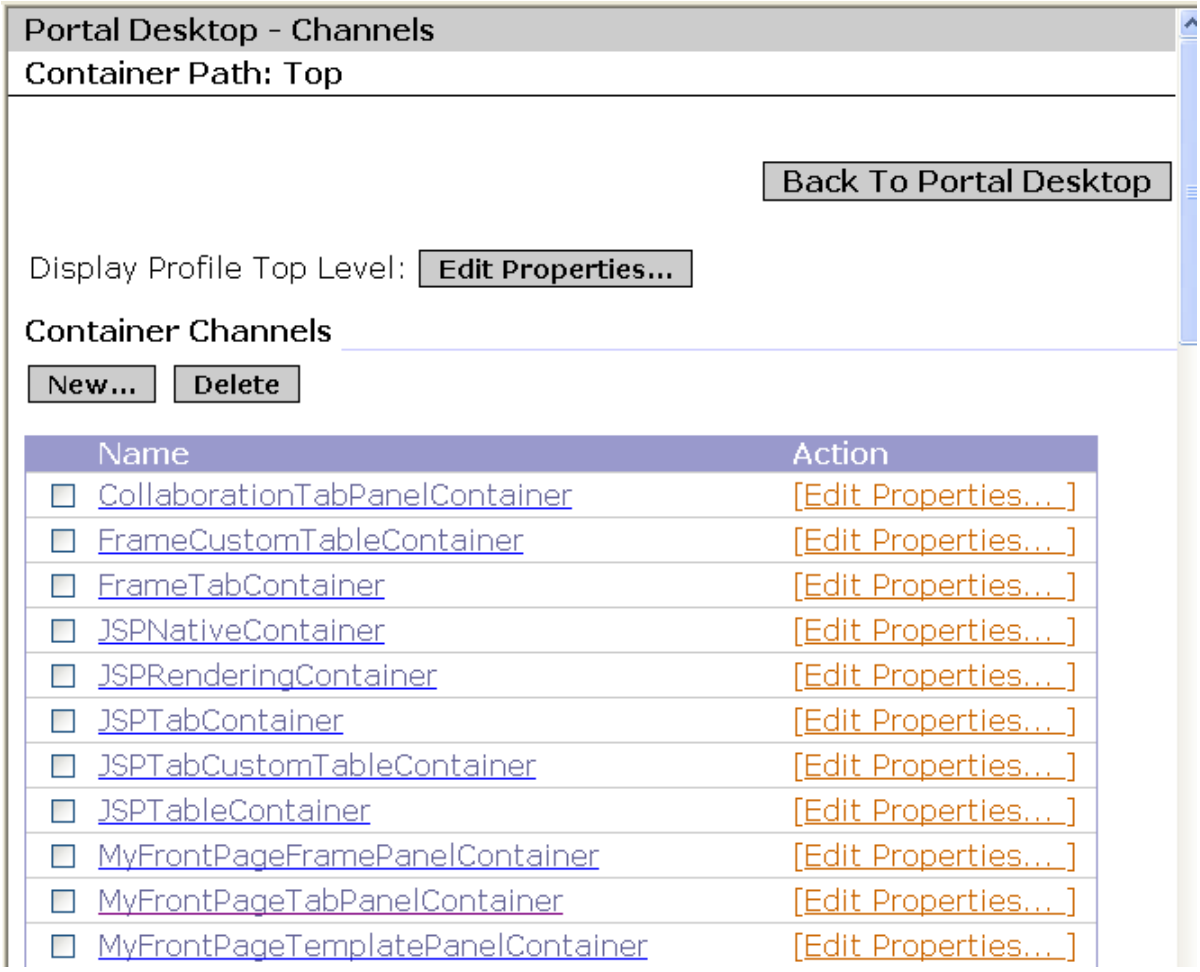
1. On the Access Manager page, make sure the **Identity Management** tab content is displayed.
2. From the **View** drop-down list select **Services**. See **Figure 99 on page 134**
3. Scroll down the **Services** (left) frame to display the **Portal Desktop** options and click the pointer icon to the right of **Portal Desktop**.

   The **Portal Desktop** frame appears on the right. See **Figure 100 on page 135**.
4. On the **Portal Desktop** frame, click the **Manage Channels and Containers** link.

   The **Portal Desktop - Channels** frame appears. See **Figure 101 on page 135**.
5. Scroll down the **Portal Desktop - Channels** frame to the **Container Channels** section (if it is not already displayed.

This section displays a list of existing Portal Desktop tab container channels. See Figure 105.

**Figure 105** List of Container Channels

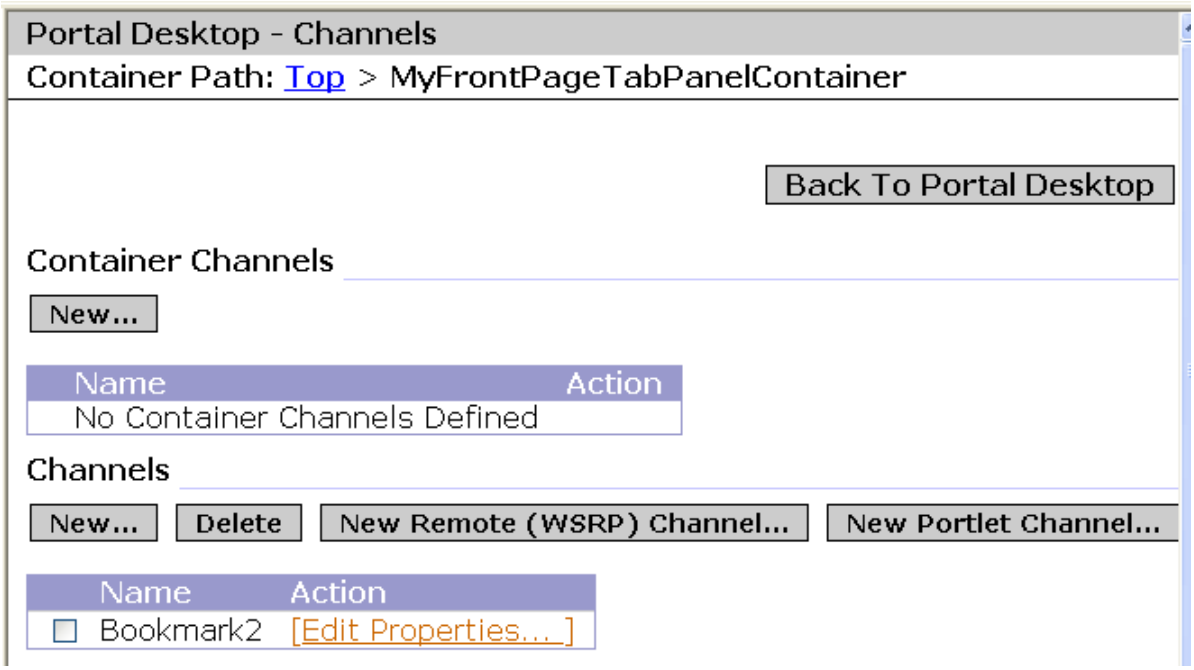



6 Click **MyFrontPageTabPanelContainer**.

**Note:** *Do **not** click the **Edit Properties** link.*

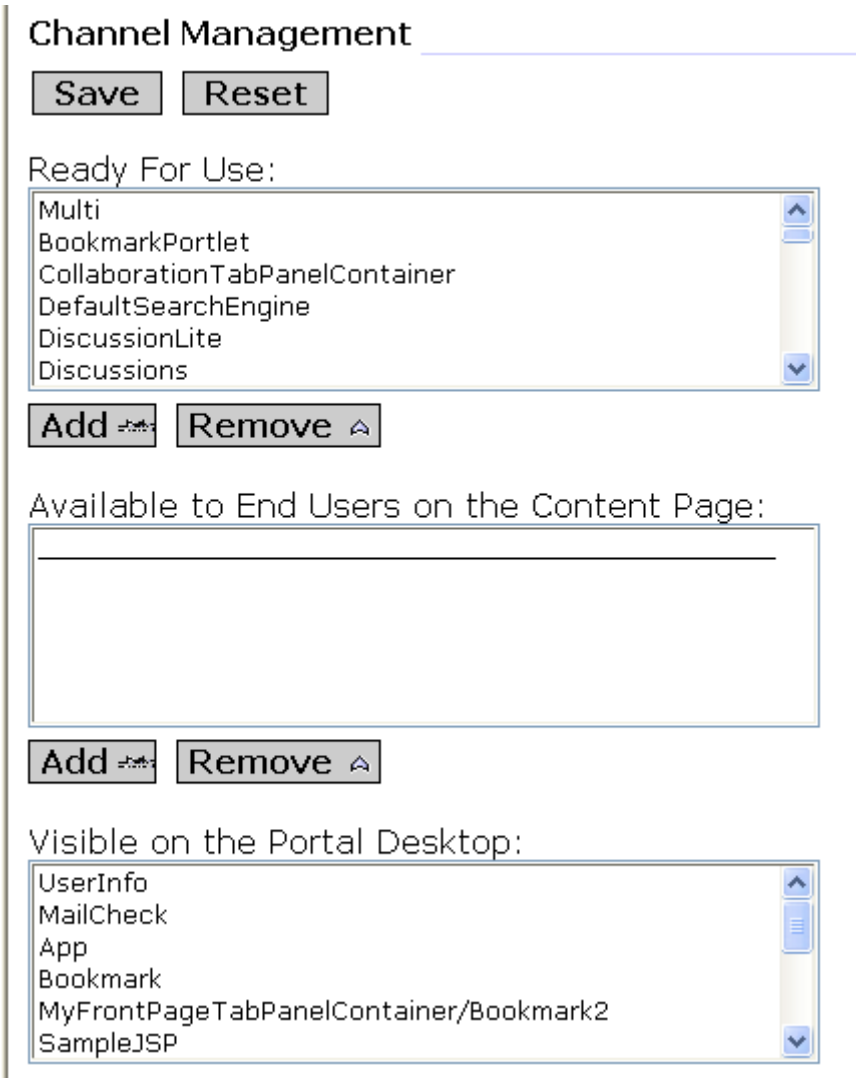
7 A frame appears, which allows you to manage the channels that appear on your **Front Page** tab. See Figure 106.

**Figure 106** Initial MyFrontPageTabPanelContainer Frame



8 Scroll down this frame to the **Channel Management** section. See Figure 107.

**Figure 107** Channel Management Section: Initial




The **Ready for Use** pane contains a list of existing channels.

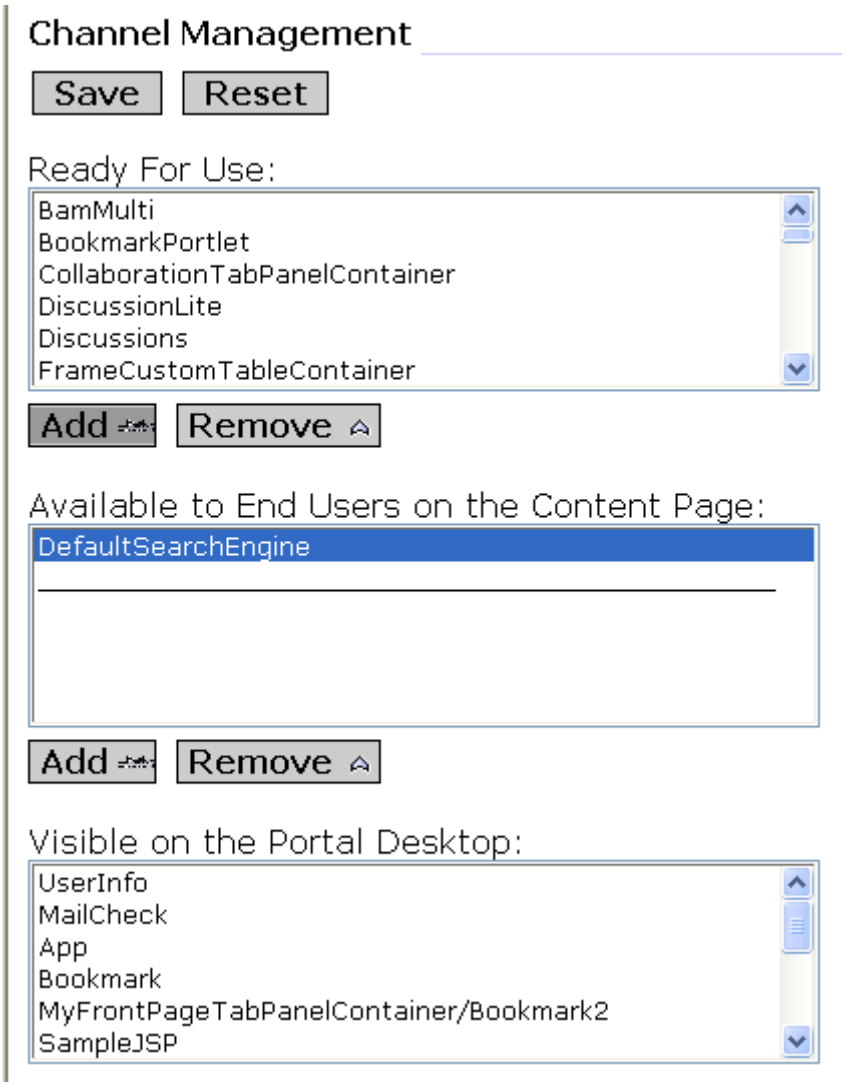
The section shown in the figure is an example. Your ***Channel Management*** section contains the Portal Server defaults plus any additional channels that have been created for your system.

9 Under **Ready for Use**, select the new channel you created under the **procedure on page 133**. In the example, the new channel is **DefaultSearchEngine**.

10 Click **Add**.

Your new channel name appears under **Available to End Users on the Content Page**. See Figure 108.

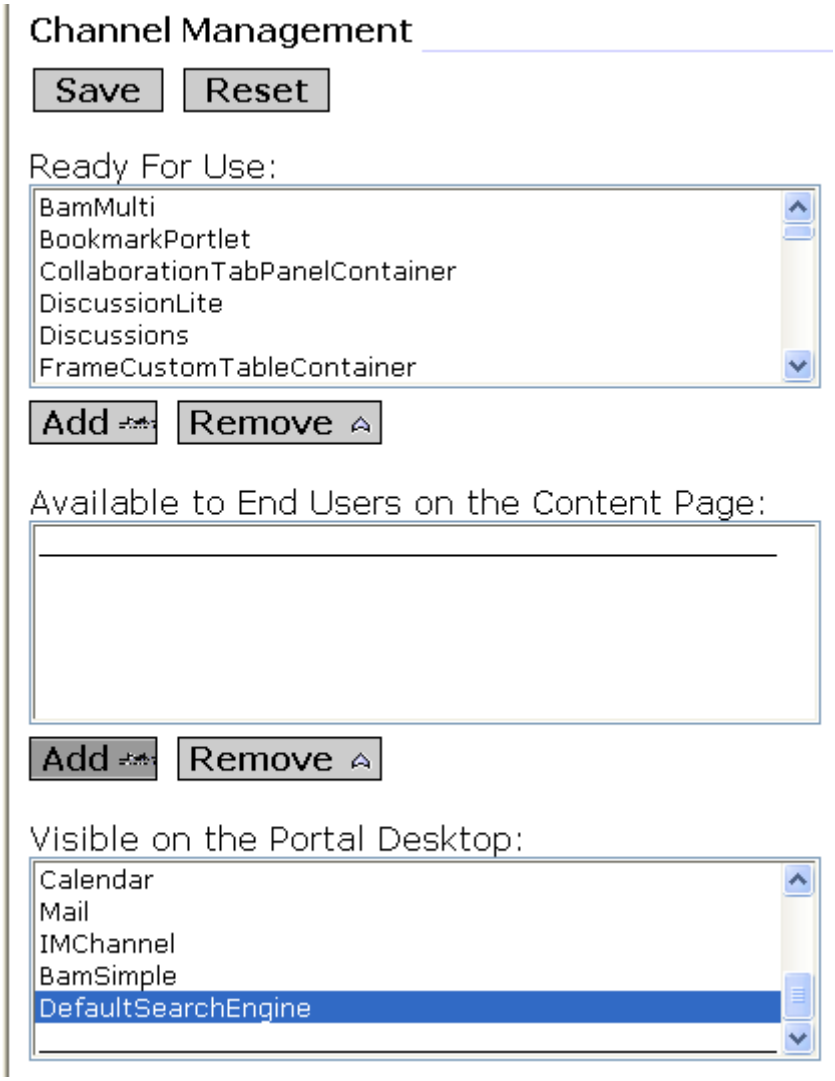
**Figure 108** Channel Management Section: First Add




11 Select the new channel (if necessary) and click **Add**.

Your new channel name appears under **Visible on the Portal Desktop**. The name appears at the end of the list, so you may need to scroll down the pane to view it. See Figure 109.

**Figure 109** Channel Management Section: Second Add




12 Click **Save**.

Your new channel is now a part of the **Front Page** tab. This channel appears the next time a user with permission to view it accesses the Portal Desktop and selects the **Front Page** tab.

### Viewing a New Channel

Using this procedure, you can place any existing channel on any existing tab panel page you choose, and then view that channel.

### To view your new channel on the Portal Desktop

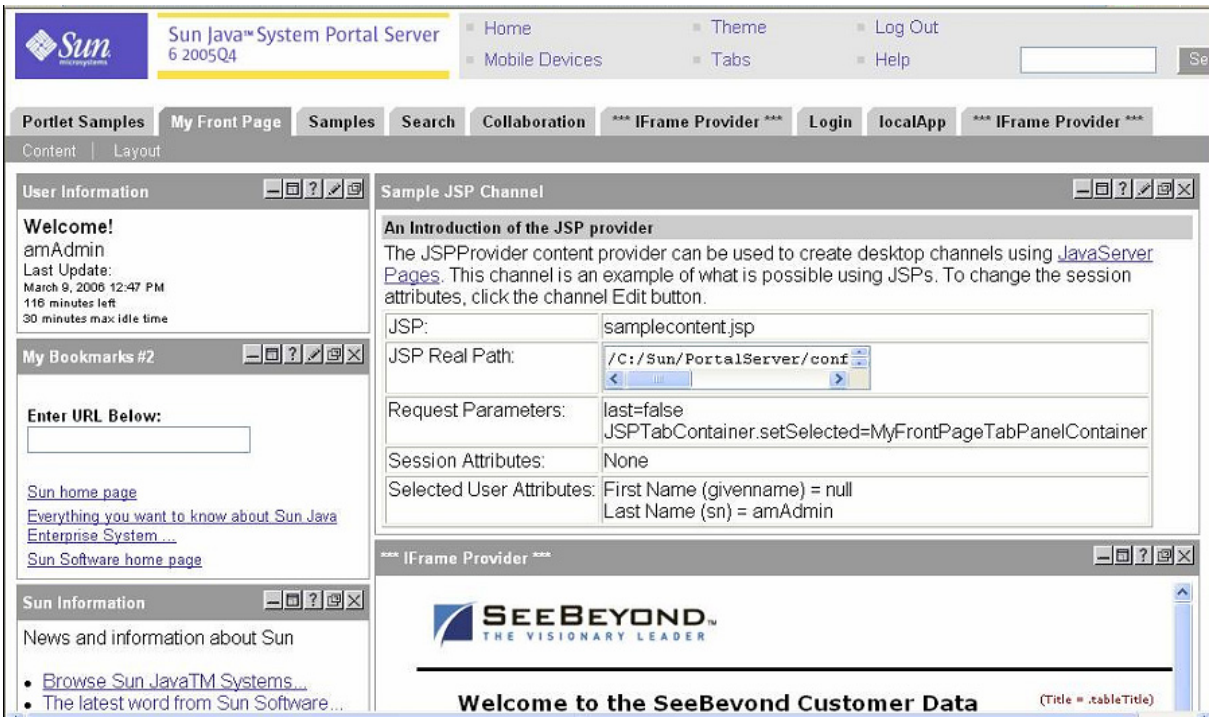
1 Perform either of the following operations:

- On the Windows **Start > All Programs** menu, choose **Sun Microsystems > Portal Server > Portal Desktop**.
- Enter the following URL on your Web browser:

  `http://<host name>:38080/amserver/portal/dt`

The Portal Desktop Welcome page appears with the **My Front Page** tab displayed. See Figure 110, which shows an example.

**Figure 110** Portal Server 6 Portal Desktop Welcome Page




2 You can scroll down this page to view your new Portal Server channel.

## 9.4.4 Running eBAM Studio Applications with Portal Server 7

This section explains how to set up Sun Java System Portal Server 7 to run with the Java CAPS applications, including eBAM Studio.

### Before You Start

Take care to ensure you have completed the prerequisite actions listed under **Before Installing Portal Server** on page 120.

## System Requirements

You must run Portal Server 7 in:

- Sun Java System Application Server, Version 8.1

If you want to deploy JSR 168 portlets with eBAM Studio, you must deploy Portal 7 together with the application server on any of the following platforms:

- Solaris 10 OS for SPARC and x86 platforms
- Solaris 9 OS for SPARC and x86 platforms
- Solaris 8 OS for the SPARC platform
- Red Hat Enterprise Linux WS/AS/ES 2.1 to 2.1U6
- Red Hat Enterprise Linux WS/AS/ES 3.0 to 3.0U4

## Supported Operating Systems

For specific information on all operating systems supported by Portal Server 7 in conjunction with the Java CAPS and eBAM Studio, see the **Readme.txt** file for eBAM Studio.

### Important

The port numbers provided in all access URL examples are the system defaults. The actual port numbers used by your system's configuration may be different. Before you begin using the procedures provided in the rest of this section, make sure you have verified the correct port number for any URL referenced by a given procedure.

## Installation

For complete instructions on installation, see the Sun Microsystems *Sun Java System Portal Server 7 Installation Guide*. See **Reference Documentation** on page 120 for an explanation of how to find this document.

## Setting Up an IFrame Channel

This section describes how to create and configure an IFrame channel for Portal Server 7.

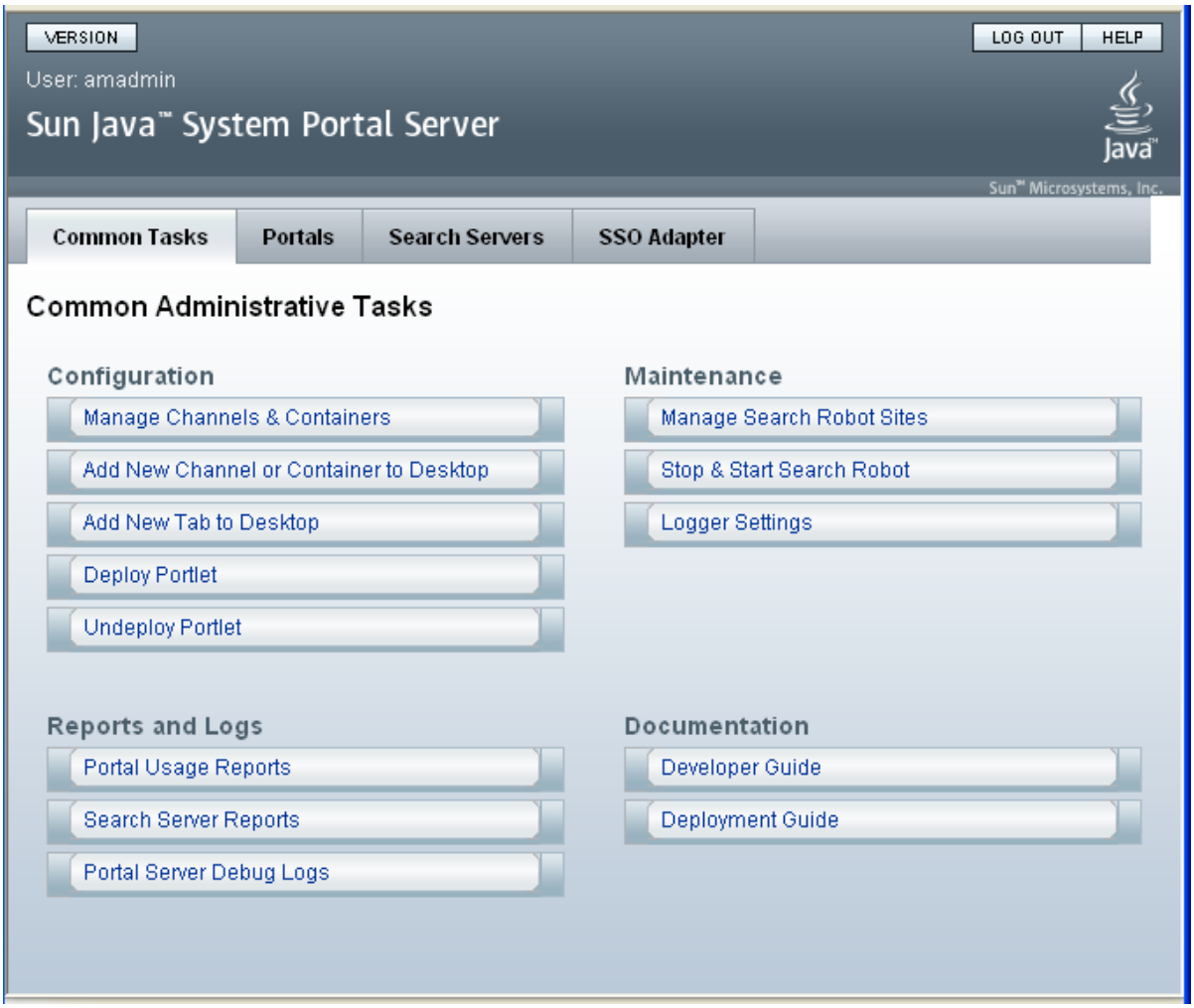
### To set up an IFrame channel

1. Log on to Portal Server 7 Console (**psconsole**) with Access Manager privileges, using the following URL:

   ```
   http://<host name>:38080/psconsole
   ```

The Portal Server 7 Console page appears. See Figure 111.

**Figure 111** Portal Server 7 Console Page



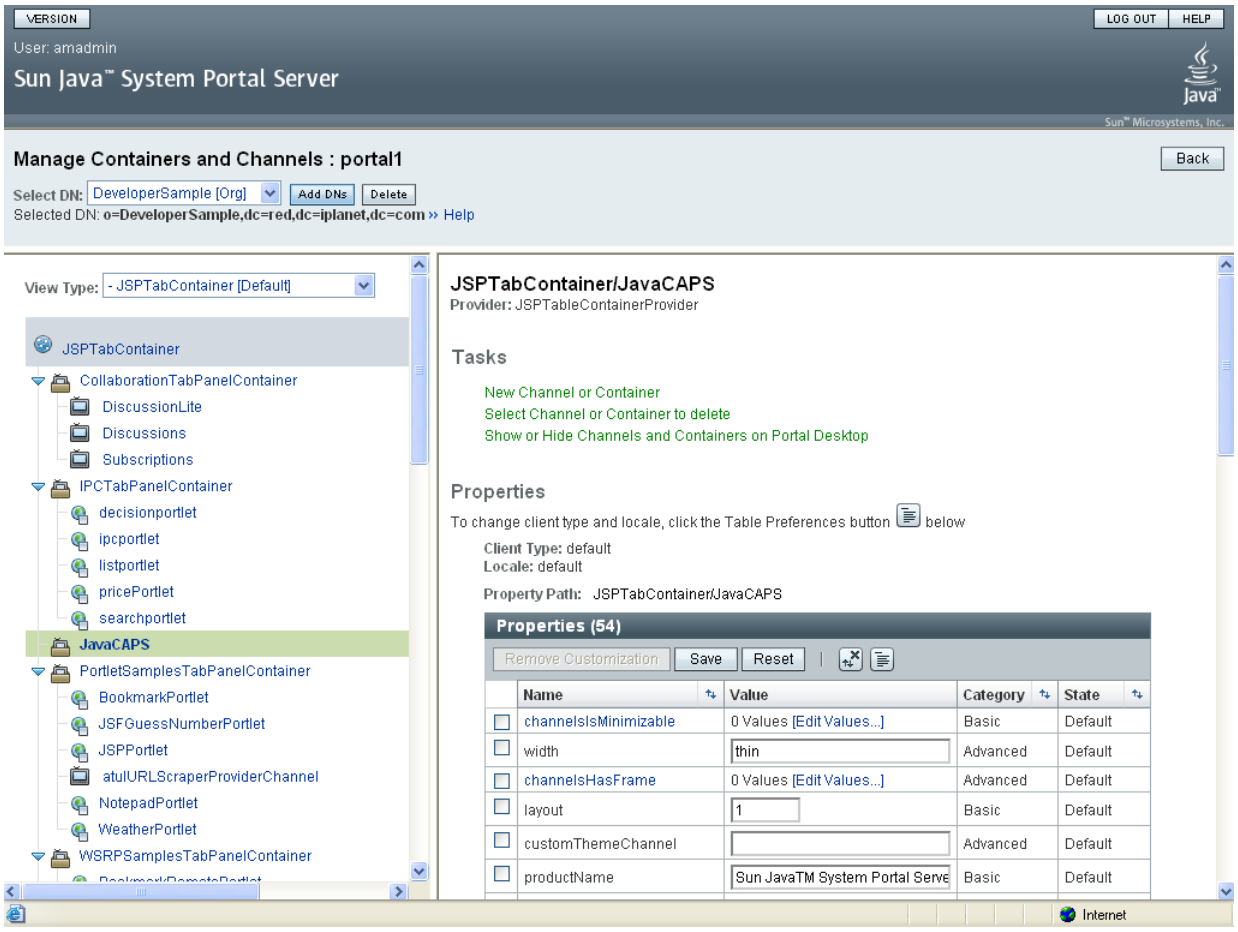

2 On the **Common Tasks** tab, under **Configuration**, click **Manage Channels And Containers**.

A window appears that allows you to choose the portal and distinguished name (DN) you want to create the channel for.

3 For this example, choose **portal1** for the portal and **DeveloperSample [Org]** for the DN, and click **OK**.

The Manage Containers and Channels: portal1 page appears. See Figure 112.

**Figure 112** Manage Containers and Channels : portal1 Page: Initial




Using this page, you can choose an existing tab or create a new one. For an explanation of how to create a new tab, see the Sun Microsystems **Sun Java System Portal Server 7 Technical Overview** document.

4 In the left frame, select the container in which you want to create the new channel. In the example in Figure 112 you select the **JavaCAPS** container.

5 In the right frame, select **New Channel or Container**.

A new window appears. Using that window, perform the following steps:

C Select the Portal instance and DN you want and click **Next**.

D On the next window, choose **Provider Channel** for the **Channel Type** and click **Next**.

E On the next window, choose **IFrameProvider** for the **Provider** and click **Next**.

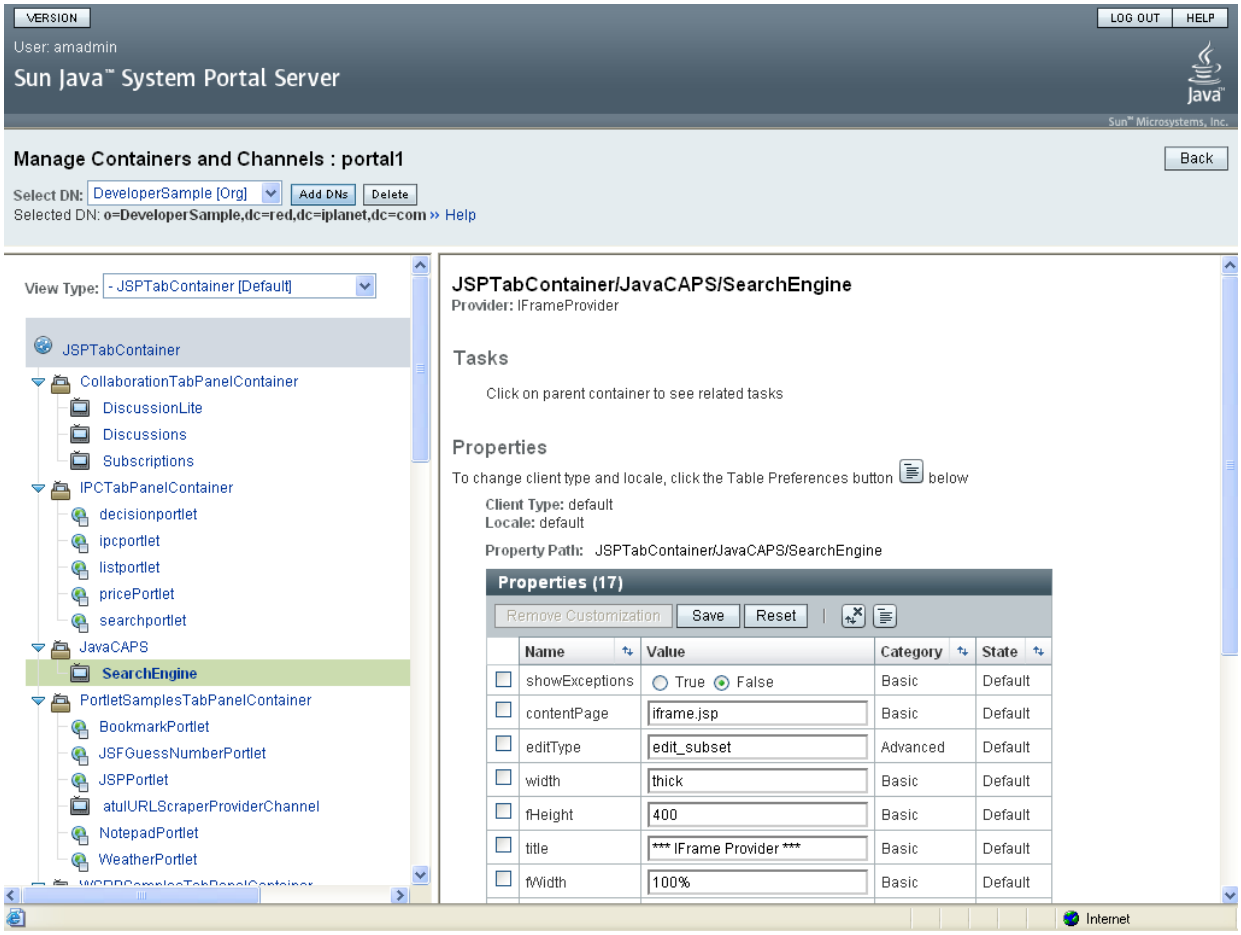
F On the next window, enter a name for your channel, **SearchEngine** for this example, and click **Next**.

G In the next window, view the information you have entered to make sure it is correct, and then click **Finish**.

H On the next window, which indicates you have successfully created a new channel, click **Close**.

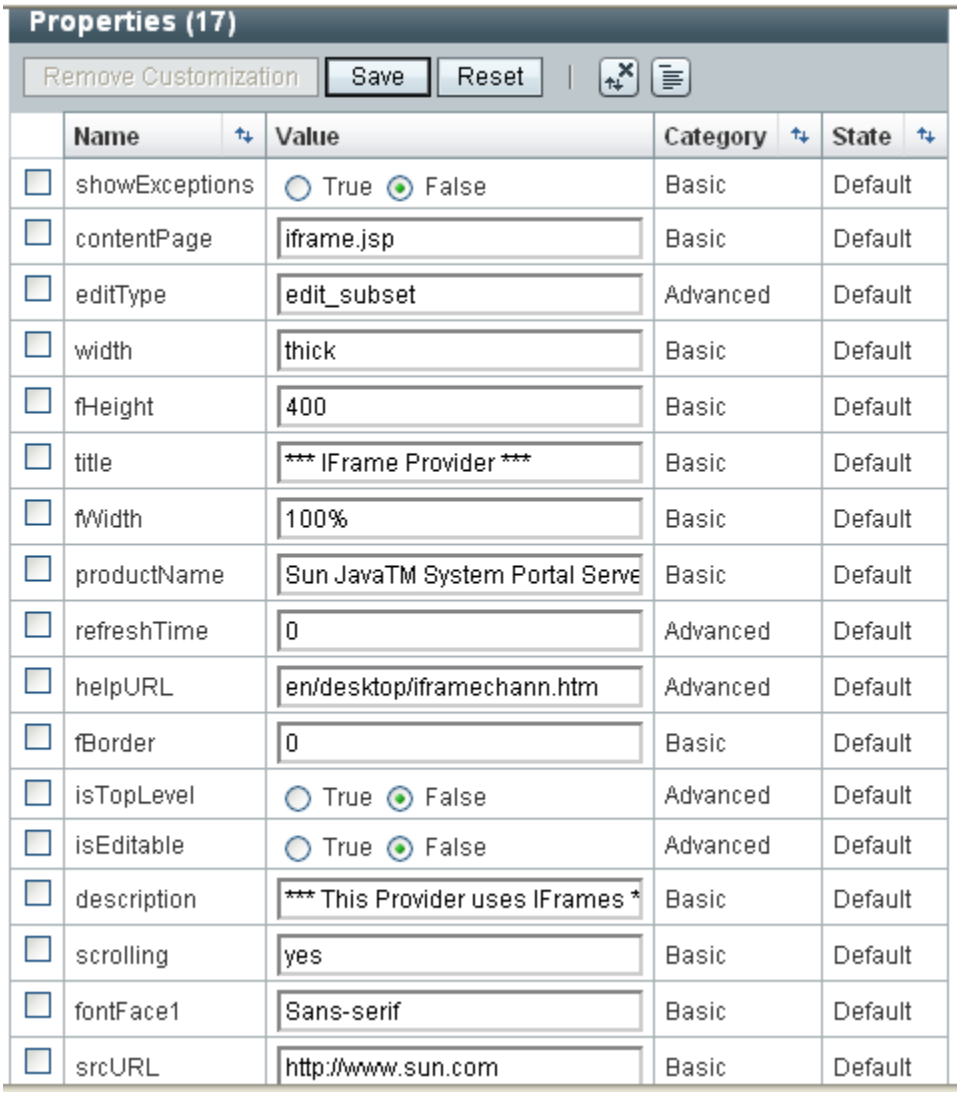
The Manage Containers and Channels: portal1 page appears again. The page now displays properties for your new channel, in the right frame. See Figure 113.

**Figure 113** Manage Containers and Channels : portal1 Page: With New Channel



6 On the right side of the page, scroll down the pane to display all the new channel's properties. See Figure 114.

**Figure 114** Channel Properties Pane




7 Be sure to enter the URL for your new channel under **srcURL** and give your new channel a **title**.

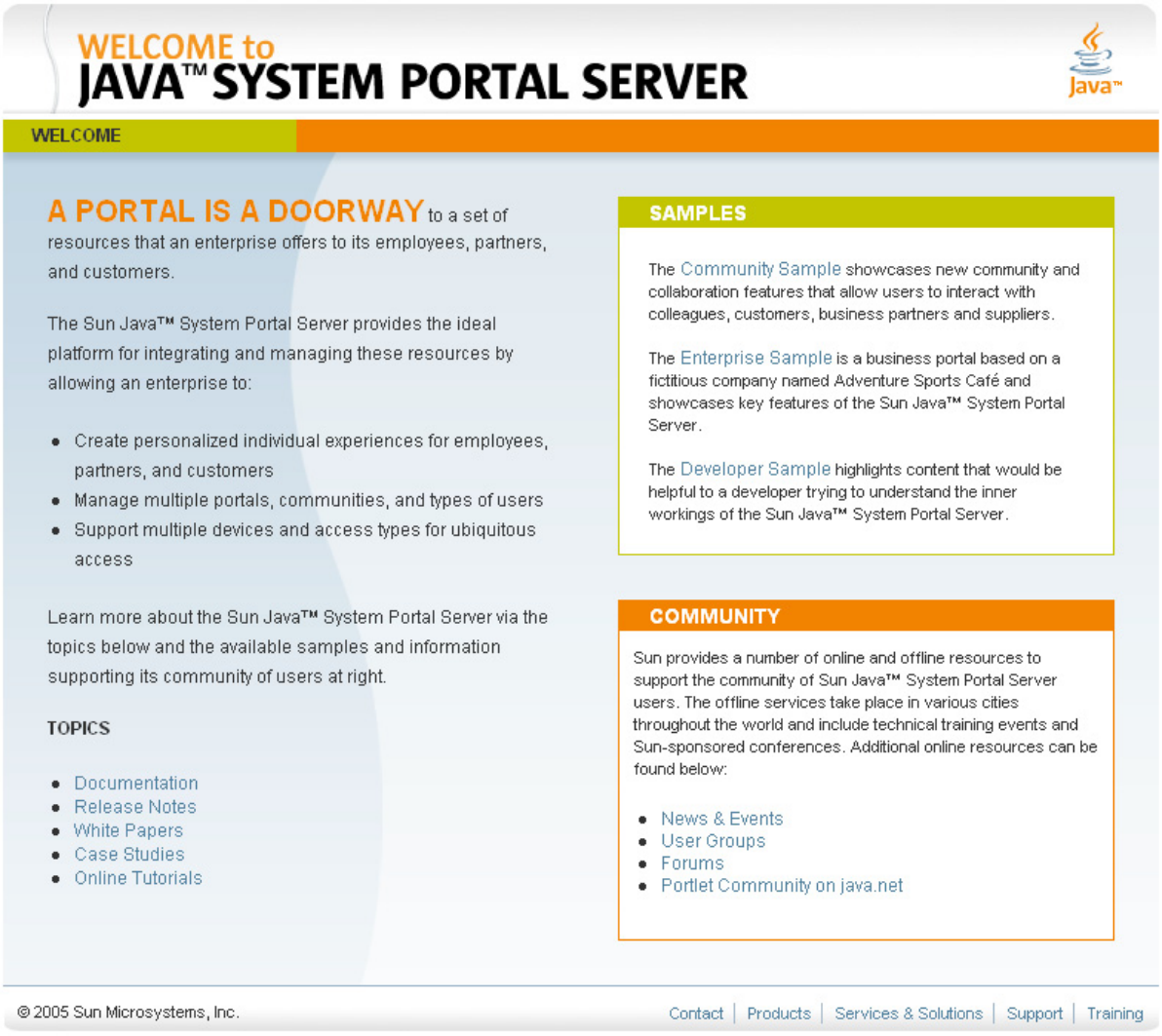
8 Supply other configuration parameters, as needed.

9 When you are finished, click **Save**.

10 Access the Portal Desktop, using `http://<host name>:38080/portal`, to view your new channel.

The Portal Desktop Welcome page appears. See Figure 115.

**Figure 115** Portal Server 7 Portal Desktop Welcome Page




11 On the Welcome page, select the **Developer Sample** link.

The Developer Sample page appears.

12 In this example, your new channel appears under the **Java CAPS** tab.

## Setting Up a JSR 168 Portlet Channel

This section describes how to create and configure a JSR 168 portlet channel for Portal Server 7.

Portal Server 7 patches are required to register Java CAPS JSR 168 portlets. See the Portal Server technical note "Integrating Java CAPS With Sun Java System Portal Server" referenced under **Necessary Patches** on page 121, for installation instructions.

### Before You Start

Before creating a JSR 168 channel, you must deploy the eBAM Studio **.ear** file to the application server on which Portal Server is running and register the same **.ear** file with Portal Server.

### To deploy eBAM Studio applications

1. Make sure the Sun Java System Application Server is running.
2. Java CAPS applications require special permissions. Make sure the appropriate permissions have been set up correctly in the **server.policy** file.
3. Deploy the eBAM Studio **.ear** file to the application server on which Portal Server is running. You can do this operation using:
   - Enterprise Designer
   - Enterprise Manager
   - A Sun Java System Application Server's administrator interface, either Admin Console or the command line; a command-line example follows:

```
./asadmin deploy --user admin /tmp/prj2dp8.ear
```

See the *eGate Integrator User's Guide* and *eGate Integrator System Administration Guide* for details on how to deploy an **.ear** file using Enterprise Designer and Enterprise Manager. See the **procedure on page 126** for information on how to deploy an **.ear** file using Admin Console.

### Registering eBAM Studio JSR 168 application with Portal Server 7

Use the **psadmin register-portlet** command in the system's command line to register the portlet **.ear** file to a particular portal and DN. The following text shows an example of this command:

```
./psadmin register-portlet -u amadmin -f pfile -p portal1
-d o=Sample,dc=sun,dc=com
/tmp/168/simplejsr168dpsun.ear
```

**Note:** *For details on how to use the command line, see the Sun Microsystems* **Sun Java System Portal Server 7 Command-Line Reference** *document.*

After you have done this action, the portlet becomes available in the list of portlets for use with a JSR 168 channel.

**Note:** *If you redeploy an application without changing the application* **.ear** *file name, the ServletContext name and the Portlet name, you do not need to perform registration again.*

### To create a JSR 168 portlet channel

1. Follow steps 1 through 4 under **Setting Up an IFrame Channel** on page 146.
2. In the right frame, select **New Channel or Container**.

   A new window appears. Using that window, perform the following steps:

   A. Select the Portal instance and DN you want and click **Next**.

B On the next window, choose **JSR 168 Channel** for the **Channel Type** and click **Next**

C On the next window, choose one of the portlet providers you have registered, from the drop-down list.

After registering the portlet with **psadmin**, a provider for your portlet is available from the list of portlet providers. Your provider appears as *<servlet-context-name>.<portlet-name>*. For example, in eVision, *<portlet-name>* defaults to **PageFlowPortlet**. So, if you generate an eVision portlet using **myContext** for *<servlet-context-name>*, the portlet provider is listed as **myContext.PageFlowPortlet**.

D On the next window, enter a name for your channel and click **Next**.

E In the next window, view the information you have entered to make sure it is correct, and then click **Finish**.

F On the next window, which indicates you have successfully created a new channel, click **Close**.

The Manage Containers and Channels: portal1 page appears again. The page now displays your new JSR 168 channel.

3 On the right side of the page, scroll down the pane to display all the new channel's properties.

4 Enter the **title** you want.

5 Supply other configuration parameters, as needed.

6 When you are finished, click **Save**.

7 Access the Portal Desktop, using `http://<host name>:38080/portal`, to view your new channel.

### Unregistering eBAM Studio JSR 168 application with Portal Server 7

When appropriate, you can use the **psadmin unregister-portlet** command to unregister a portlet. This step requires the name of the **.ear** file that was registered, for example:

```
./psadmin unregister-portlet -u amadmin -f pfile -p portal1
-d o=Sample,dc=sun,dc=com simplejsr168dpsun
```

Appendix A

# Chart Types

eBAM provides four chart types. Appendix A discusses those charts and describes their properties.

**What's in This Chapter**



## A.1 Chart Types

The chart types eBAM provides include:

- *Pie charts* display elements in the dataset view as wedge-shaped segments (slices) comprising an entire disk (pie). Each segment's relation to the pie and to other segments is cued visually by its apparent area, based on its subtended angle. For an example, see **Figure 66 on page 95**.
- *Bar charts* display elements in the dataset view as rectangles (bars) in a rectilinear setup where each bar's relation to the total and to other bars is cued visually by its apparent area, based on its length. Bar charts can have labels on either or both axes to facilitate quantitative readings. For an example, see **Figure 71 on page 99**.
- *Meters*, also called *meter charts*, display conditions as a needle on a dial, similar to a tachometer or clock face. At designated thresholds on the range, differing colors at the outside of the dial are used to signify when the measured condition is in normal range, warning range, or critical range.
- *Trafficlights* convey conditions at a glance, using one, two, or three indicators, using the metaphor of a traffic signal: a light in a green, amber, or red lens indicates a normal, warning, or critical condition. (Colors can be tailored to suit.) For an example of a two-dimensional trafficlight array, see **Figure 69 on page 97**.

All charts have common properties, and each has properties specific to its own type:

- **"Properties Common to All Chart Types" on page 155** lists properties common to all four chart types.
- **"Properties Common to Pie and Bar Charts" on page 155** lists properties common to pie and bar charts only.
- **"Properties Specific to Pie Charts" on page 156** lists properties specific to pie charts.

- **"Properties Specific to Bar Charts" on page 156** lists properties specific to bar charts.
- **"Properties Specific to Meters" on page 156** lists properties specific to meters.
- **"Properties Specific to Trafficlights" on page 158** lists properties specific to trafficlights.

**Table 21** Properties Common to All Chart Types

| Property Name | Default | Notes |
|---|---|---|
| Display Title | True | Whether or not the chart title is displayed. |
| Title | | Any string; set initially to the name of the chart as created. |
| Title Font | | You can use any of 52 fonts, ranging in size from 9-point to 72-point, with or without bold and/or italic attributes. |
| Title Alignment | CENTER | You can change the default (CENTER) to LEFT or RIGHT. |
| Title Color | | You can either pick a color swatch or specify an exact color:<br>▪ Specify percentages for HSB: Hue, Saturation, Brightness<br>▪ Specify values (0-255) for RGB: Red, Green, Blue. |
| Title Background | | |
| Draw Border | False | Whether or not to draw a border around the chart. |
| Border Color | | You can specify any color either by picking a swatch or by specifying HSB or RGB. |
| Background Color | | |
| Image Width | 680 | Width, in pixels, of the image portion of the chart. |
| Image Height | 420 | Height, in pixels, of the image portion of the chart. |
| Chart Width | 680 | Width, in pixels, of the entire chart itself. |
| Chart Height | 420 | Height, in pixels, of the entire chart itself. |
| Frequency in seconds | 60 | How often to update the chart with a new data view. |

**Table 22** Properties Common to Pie and Bar Charts

| Property Name | Default | Notes |
|---|---|---|
| 3D | True | Whether or not a three-dimensional effect is displayed. |
| Depth Factor | 0.3 | (for Pie chart) Amount by which the chart seems three-dimensional. |
| Include Legend | False | Whether or not to display a legend with the chart. |
| Legend Anchor | SOUTH | Where to position the starting point for the chart legend. |
| Circular | False | (for Pie chart) For an elliptical (titled-circle) chart, keep the set to **False**. For a circular chart, set this to **True**. |
| Number Format | 0 | How many digits to display, and whether to display digits in comma-separated groups of three. |
| Display Navigation Buttons | False | Whether the chart viewer displays a chevron [>] as a hyperlink to the chart specified in the next field. |
| Navigation Chart Name | | Name of the "next" chart targeted by the hyperlink in the chart viewer. |

**Table 23** Properties Specific to Pie Charts

| Property Name | Default | Notes |
|---|---|---|
| Show Section Labels | False | Whether to display a label name for the data series. *(Only Category queries with one or more Series values.)* |
| Section Label | Name,Value | Choices consist of: Name; Value; Percent; Name,Value; Name,Percent; Value,Percent; and Name, Value, Percent. |
| Section Label Font | | Any of 52 fonts, 9-pt to 72-pt, bold and/or italic or not. |
| Section Label Color | | You can set this either by picking a swatch or by specifying HSB or RGB. |
| Section Label Gap | 0.3 | Space used by the section label gap (0.0=none; 1.0=all). |
| Direction | Clockwise | Each successively larger value is displayed either right (clockwise) or left (anticlockwise) of the next smaller. |
| Interior Gap | 0.3 | Space to be used by the interior gap (0.0=none; 1.0=all). |

**Table 24** Properties Specific to Bar Charts

| Property Name | Default | Notes |
|---|---|---|
| Orientation | VERTICAL | Which way (vertical or horizontal) the bars run. |
| Show X-Axis | True | Whether or not to display the X axis. |
| Show X-Axis Label | True | Whether or not to display the label for the X axis. |
| X-Axis Label | domain | The text to display as a label for the X axis. |
| Show Y-Axis | True | Whether or not to display the Y axis. |
| Show Y-Axis Label | True | Whether or not to display the label for the Y axis. |
| Y-Axis Label | range | The text to display as a label for the Y axis. |
| Stacked | False | *(Only Category queries with one or more Series values.)* Whether or not to stack the data series. |
| Category Label Type | None | *(Only Category queries with one or more Series values.)* To display the category name, set this to Name. To display the category values, set this to Value. To suppress the label altogether, set this to None. |
| Series Label Type | None | *(Only Category queries with one or more Series values.)* To display the series names, set this to Name. To display the series values, set this to Value. To suppress the label altogether, set this to None. |
| Category Gap Percent | 10 | *(Only Category queries with one or more Series values.)* To set the Category Gap percent between the series of Bars. |

**Table 25** Properties Specific to Meters

| Property Name | Default | Notes |
|---|---|---|
| Minimum Value | 0.0 | Lower bound of the meter. |

**Table 25** Properties Specific to Meters (Continued)

| Property Name | Default | Notes |
|---|---|---|
| Maximum Value | 3.0 | Upper bound of the meter. |
| Value Font | | Any of 52 fonts, 9-pt to 72-pt, bold and/or italic or not. |
| Value Color | | To set the color of the value labels. You can set this either by picking a swatch or by specifying HSB or RGB. |
| Minimum Normal Value | 0.0 | Values below this threshold are too low to be normal. |
| Maximum Normal Value | 1.0 | Values above this threshold are too high to be normal. |
| Normal Range Color | | To set the color of the Normal range. You can set this either by picking a swatch or by specifying HSB or RGB. |
| Minimum Warning Value | 1.0 | Values below this threshold are too low for warnings. |
| Maximum Warning Value | 2.0 | Values above this threshold are too high for warnings. |
| Warning Range Color | | To set the color of the Warning range. You can set this either by picking a swatch or by specifying HSB or RGB. |
| Minimum Critical Value | 2.0 | Values below this threshold are too low to be critical. |
| Maximum Critical Value | 3.0 | Values above this threshold are beyond being critical. |
| Critical Range Color | | To set the color of the Critical range. You can set this either by picking a swatch or by specifying HSB or RGB. |
| Number Format | 0.000 | How many digits to display, and whether to display digits in comma-separated groups of three. |
| Units | units | To specify the units value. |
| Draw Chart Border | False | Whether or not to display a border around the chart. |
| Dial Type | Circle | You can change this to either Circle, Pie, or Chord. |
| Dial Background Color | | To set color of the dial background. You can set this either by picking a swatch or by specifying HSB or RGB. |
| Tick Label Type | Value Label | Whether to show marks with values, or just marks. |
| Tick Label Font | | Any of 52 fonts, 9-pt to 72-pt, bold and/or italic or not. |
| Needle Color | | You can specify any color, by swatch, HSB, or RGB. |
| Meter Angle | 270 | Angle subtended by the entire range of the meter. |
| Display Navigation Buttons | False | Whether the chart viewer displays a chevron [>] as a hyperlink to the chart specified in the next field. |
| Navigation Chart Name | | Name of the “next” chart targeted by the hyperlink in the chart viewer. |

**Table 26** Properties Specific to Trafficlights

| Property Name | Default | Notes |
|---|---|---|
| Display Housing | True | Whether or not to displays the Housing background in the chart. |
| Housing Margin | 0 | How much additional space to provide around the Housing. |
| Extend Housing To Edge | False | Whether or not to display the extended Housing edges in the chart. |
| Maintain Housing Proportionality | True | Whether to retain the ratio of height to width. |
| Housing Color | Need to select | To set the Color of the Housing. You can set this either by picking a swatch or by specifying HSB or RGB. |
| Linearize Date | False | Whether or not to linearize the data in the chart specified. |
| Use Fixed Horizontal Display Limit | True | Whether or not to use the fixed horizontal display limit. |
| Fixed Horizontal Display Limit | 1 | To set the value for fixed horizontal display limit. |
| Use Fixed Vertical Display Limit | True | Whether or not to use the fixed vertical display limit. |
| Fixed Vertical Display Limit | 1 | To set the value for the fixed vertical display limit. |
| Lens Display Count | 3 | Number of lenses to display: 1, 2, or 3. |
| Lens Display Orientation | VERTICAL | Which way (vertical or horizontal) the traffic light is oriented. |
| Lens Display Direction | Right to Left/ Bottom to Top | In horizontal orientation, successively worse states are displayed either right-to-left or left-to-right.<br>In vertical orientation, successively worse states are displayed either top-to-bottom or bottom-to-top. |
| Housing Label Relationship | in | Whether the labels are inside or outside the housing. |
| Housing Label Source | none | Choices consist of: none; category; series; category, series; value; category, value; series, value; and category, series value. |
| Housing Label Position | top | You can change this to either top, left, right, or bottom. |
| Housing Label Font | San Serif 10 Plain | You can select any of the 52 fonts with 3-pt to 48-pt size. |
| Housing Label Color | (white) | To set the color of the housing labels. You can set this either by picking a swatch or by specifying HSB or RGB. |
| Center Labeled States | False | Whether or not to center the labels for the states (labels such as “Normal”, “Warning”, and “Critical”). |
| State Label Source | none | Choices consist of: none; static label, category; series; category, series; value; static label, value; category, value; series, value; and category, series value. |

**Table 26** Properties Specific to Trafficlights (Continued)

| Property Name | Default | Notes |
|---|---|---|
| State Label Position | bottom | You can change this to either top, left, right, or bottom. |
| State Label Font | San Serif 10 Plain | You can select any of the 52 fonts with 3-pt to 48-pt size. |
| State Label Color | (white) | To set the color of the state labels. You can set this either by picking a swatch or by specifying HSB or RGB. |
| Lens Label Source | none | Choices consist of: none; static label, category; series; category, series; value; static label, value; category, value; series, value; and category, series value. |
| Lens Label Font | San Serif 10 Plain | You can select any of the 52 fonts with 3-pt to 48-pt size. |
| Lens Label Color | (white) | To set the color of the lens labels. You can set this either by picking a swatch or by specifying HSB or RGB |
| Lens Shape | Round | You can change this to either Round or Square. |
| Lens Style | SmallRidges | You can change this to either Plain, Glow, SmallRidges, BigRidges, or Elevator. |
| Normal Static Label | Normal | To set the name of normal static label in the chart. |
| Minimum Normal Value | 0.0 | Values below this threshold are too low to be normal. |
| Maximum Normal Value | 1.0 | Values above this threshold are too high to be normal. |
| Normal Range Color | (red) | To set the color of the normal range. You can set this either by picking a swatch or by specifying HSB or RGB. |
| Warning Static Label | Warning | To set the name of warning static label in the chart. |
| Minimum Warning Value | 1.0 | Values below this threshold are too low for warnings. |
| Maximum Warning Value | 2.0 | Values above this threshold are too high for warnings. |
| Warning Range Color | (yellow) | To set the color of the Warning range. You can set this either by picking a swatch or by specifying HSB or RGB. |
| Critical Static Label | Critical | To set the name of critical static label in the chart. |
| Minimum Critical Value | 2.0 | Values below this threshold are too low to be critical. |
| Maximum Critical Value | 3.0 | Values above this threshold are beyond being critical. |
| Critical Range Color | (green) | To set the color of the Critical range. You can set this either by picking a swatch or by specifying HSB or RGB. |

Appendix B

# Persistence and Monitoring

Persistence and monitoring features are optional. If you use them, they require a different database—the *eInsight engine* database—to collect and persist data from your business processes (BPs).

See the *Sun SeeBeyond eInsight Business Process Manager User's Guide* for eInsight engine database requirements.

**What's in This Chapter**



## B.1 Overview

eInsight provides scripts to create the eInsight database schema, which can be used to collect and persist data from your BPs. (The eInsight database schema is optional, and is independent of any databases used by eBAM.)

After the eInsight engine database schema has been created and configured for use by a particular DB username, the instance must be referenced by the BPs whose activities are to be persisted by it. It must also be referenced by all Integration Servers that host persisted BPs.

Once a specific BP has been set up to so that its data is persisted by an instance of an eInsight engine database, you can additionally configure the BP so that its activities are monitored by Enterprise Manager.

As needed, you can set up several different eInsight database instances.

**Procedures**

The following steps are required for eInsight database and engine setup:

- **"Setting Up the Database Schema for eInsight Engine" on page 161**
- **"Configuring the eInsight Engine for Runtime" on page 162**

After the schema and engine(s) have been set up, follow these steps for each BP:

- "Configuring Specific BPs to Use Persistence" on page 164
- "Turning Monitoring On or Off for Specific BPs" on page 165

For instructions on using Enterprise Manager to monitor and log BP activity, see:

- "Monitoring" on page 165
- "Logging" on page 168

# B.2 Setting Up the Database Schema for eInsight Engine

To create the runtime recoverability database schema, you must extract and run the eInsight database scripts that are automatically installed with eInsight.

## B.2.1 Exporting and Extracting Database Scripts for eInsight

eInsight engine database scripts are supplied as compressed files. These files cannot be run in place, and must instead be exported and extracted.

**To export and extract the eInsight engine database schema scripts**

1. In Enterprise Explorer, in the project tree, expand the following folders: **Sun SeeBeyond > eInsight** > **Download Database Scripts**
2. Right-click the**.zip** file associated with the appropriate database (oracle.zip, db2.zip, sybase.zip, or sqlserver.zip) and, on the popup context menu, click **Export**.
3. Save the**.zip** file to a local folder.
4. Extract the**.zip** file contents to a local folder, which will contain:
   - **install_db.bat** or **install.sh**—Creates the tablespace, users, tables, stored procedures, and initial values.
   - **uninstall_db.bat** or **uninstall_db.sh**—Reverses what the install_db script creates; that is, it drops tables and users, and deletes stored procedures.
   - **clear_db.bat** or **clear_db.sh**—Truncates all tables without performing any other uninstall actions.
   - *database-specific***.sql** *scripts*—Called by the install_db and uninstall_db scripts. For example:, create_tables.sql, drop_tables.sql.
   - **Readme.txt**—Additional instructions specific to your database application.
5. For additional information, read the material in the Readme.txt file.

## B.2.2 Running Database Scripts for eInsight

To create, modify, or delete the runtime recoverability database schema, run the corresponding eInsight database script that you extracted in the previous procedure. The database user that executes this script must have permission to create tables.

**To install, truncate, or uninstall the eInsight engine database schema**

1. Open a command prompt (on Windows) or (on UNIX) shell.
2. Change to the directory where you extracted the eInsight engine database scripts.
3. Enter one of the following commands.
   - To create the tablespace, users, tables, stored procedures, and initial values:
   - **install_db** <*user*> <*password*> <*tnsname*>
   - To truncate the database tables created by the install_db script:
   - **clear_db** <*user*> <*password*> <*tnsname*>
   - To undo the effects of the install_db script (in other words, to drop the tables, users, and stored procedures that were created):

     **`uninstall_db`** `<user> <password> <tnsname>`

   In each case:
   - <*user*> is the database username
   - <*password*> is the password for this database user
   - <*tnsname*> is the database or TNS name

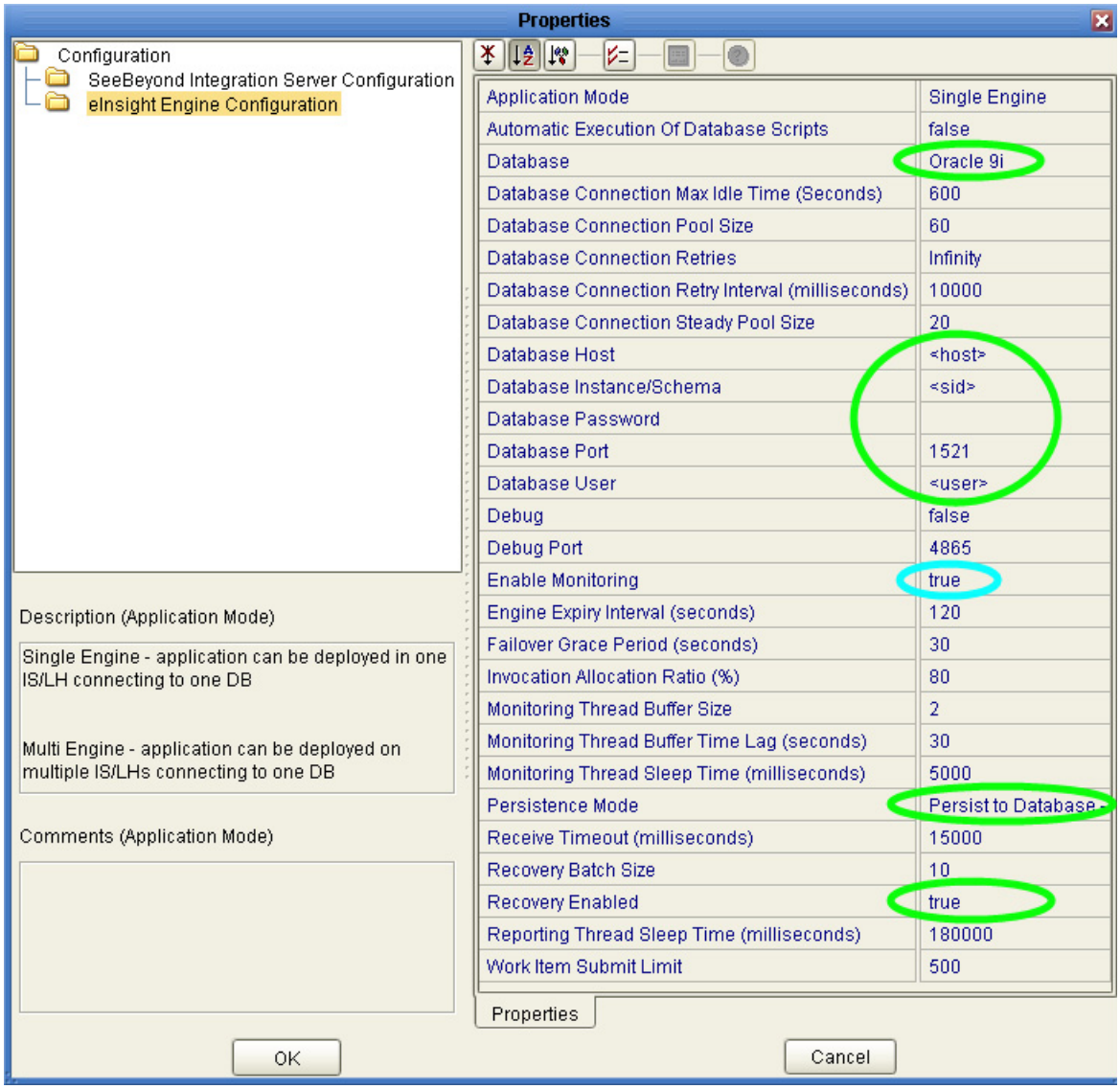
**Note:** *The default user and password created from these scripts is:* ***einsight****. You can modify the user, password, and disk space allocated for tables and user permissions. Do not modify the table and column definitions.*

## B.3 Configuring the eInsight Engine for Runtime

**To configure the eInsight engine in an Integration Server**

1. In Environment Explorer, open the environment and Logical Host (checking it out, if necessary), right-click the **Integration Server** (IS), and, on the popup context menu, click **Properties**.
2. In the Properties dialog, under Configuration click **eInsight Engine Configuration**. See Figure 116.

**Figure 116** eInsight Engine Configuration Properties




3 Set the following parameters appropriately for your database connection:

A Application Mode—Select one of the following (compare Persistence Mode):

- Multiple Engine—allows for both recovery and failover
- **Single Engine**—allows for recovery but not failover

B Automatic Execution of Database Scripts—If you have already run these scripts (see **"Running Database Scripts for eInsight" on page 161**), retain the default value: false

C **Database**—Select Oracle 9i, Oracle 8.1.7, DB2, Sybase 12.5, or SQL Server 2000.

D **Database Connection Pool Size**—Enter a positive integer to set an upper limit on the number of runtime threads spawned by the eInsight engine for activity generated by Java CAPS components or Web services. The default setting is 60; thus, if 300 requests are received, the engine processes them in five groups of 60.

E **Database Host**—Enter the name of the machine where your database resides.

F **Database Instance/Schema**—Enter the database name or SID.

G **Database Port**—Enter your database connection port number (default=1521).

H **Database User Name**—Enter the user name for your database.

I **Enable Monitoring**—For monitoring, change this from the default to: **true**.

J **Password**—Enter the password for your database user.

K **Persistence Mode**—For persistence, change this to one of the following:

- Persist to Database - Multiple Engines (Recovery, Failover)
- Persist to Database - Single Engines (Recovery)

L **Recover During Startup**—For persistence, change this from the default to: **true**.

**Note:** *Leave other settings with their default values if you have no reason to override them.*

## B.3.1 Configuring Specific BPs to Use Persistence

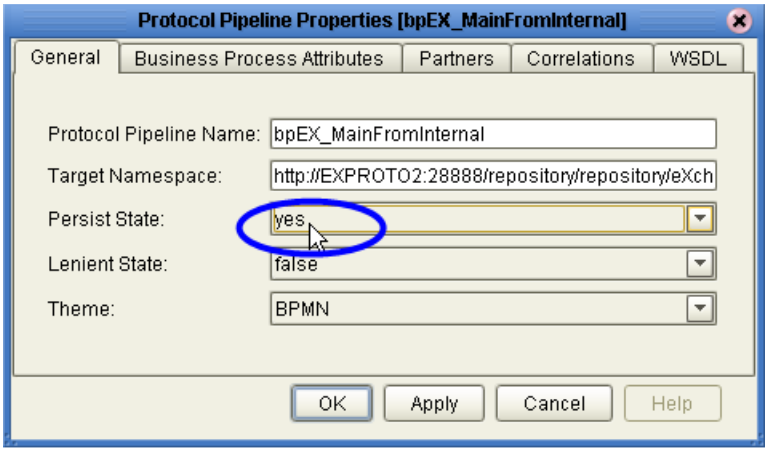
Persistence is set for each business process individually. The default setting is **no**.

**To set persistence for a specific business process**

1 In Enterprise Designer, in the project tree, right-click the BP (first use **Check Out**, if necessary) and, on the popup context menu, click **Properties.**

2 In the **General** tab (see Figure 117), change **Persist State** to **yes** and then click **OK**.

**Figure 117** Setting Persistence for a Business Process



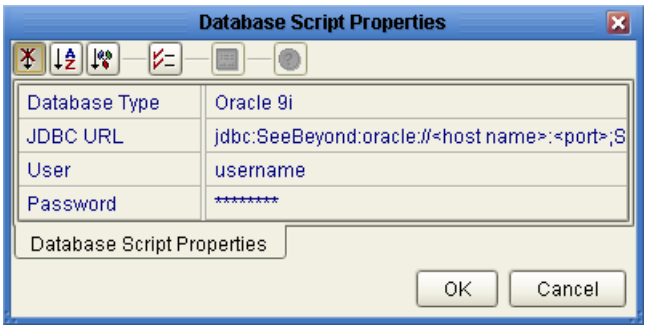

3 On the main Enterprise Designer toolbar, click **Save All**.

The project tree displays a new **Database Scripts** under your business process. In Figure 118, see the highlighted item in the project tree.

4 Right-click **Database Scripts** and, on the popup context menu, click **Properties.**

5 In the Business Process Database Script Properties, supply the correct information for your database. See Figure 118.

**Figure 118** Setting Database Script Properties for BPs




## B.3.2 Turning Monitoring On or Off for Specific BPs

Monitoring is turned on or off for each business process individually, and only applies to BPs that have been configured to use persistence.

**To start running a database script for a particular business process**

1. In the project tree, open the BP and its **Database Scripts** folder.

   If the BP does not have a Database Scripts folder, follow the **procedure on page 164**.

2. Right-click the appropriate database **Install** script and, on the popup context menu, click **Run.**

   Running this script completes the setup process for this BP, and allows you to use Enterprise Manager to monitor the BP at runtime.

**To stop running a database script for a business process**

1. In the project tree, open the BP and its **Database Scripts** folder (see Figure 118).
2. Right-click the appropriate database **Uninstall** script and, on the pop-up context menu, click **Run.**

# B.4 Monitoring

Enterprise Manager allows users to quickly identify problems with components or systems. From Enterprise Manager, you can double-click a BP component to go directly to the problem.

From Enterprise Manager (Monitoring interface), you can:

- Filter the list of displayed instances to quickly identify exceptions.
- Navigate to particular versions of a BP to monitor the progress of instances.
- Use a Web-based interface allows users to securely access the monitoring environment over the Internet.

## About the Adobe SFV plug-in

See the *eGate Integrator System Administration Guide* and the Readme.txt file for complete for information on the Adobe SVG plug-in. Although this plug-in is not required to see the graphic model in the Enterprise Manager or to use monitoring, it must be uploaded and installed if you want to view and use the special tools for the BP state diagram in Enterprise Manager.

## B.4.1 Using Enterprise Manager to Monitor BP Activity

Once persistence is configured and the project is running, you can use Enterprise Manager to monitor the activity of any BP instance for which monitoring has been enabled.

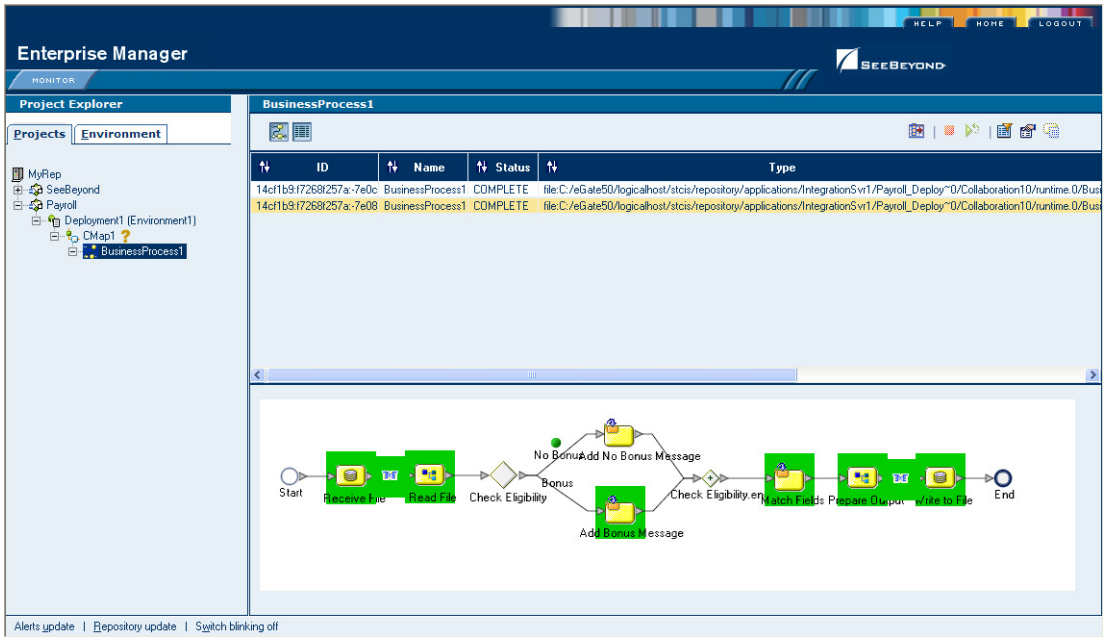
### To monitor a BP

*Before you begin:* In Enterprise Designer, ensure each BP you want to monitor has been set up to use persistence and monitoring and that it references a valid instance of an eInsight engine database. Also, all Integration Servers hosting the BPs must reference the same database instance. If necessary, see the procedures earlier in this chapter.

1. Activate a deployment profile and bootstrap a Logical Host to run the project.
2. Start Enterprise Manager. If necessary, log in.
3. In the **Home** tab, click the Enterprise Monitor icon.

   Project Explorer displays a tree structure of active projects and environments.
4. In the **Projects** tab, open the Project, Deployment Profile, and Connectivity Map, and click the name of the BP whose instance(s) you want to monitor. See Figure 119.

**Figure 119** Monitor View



## B.4.2 Using the Monitor Tool Palettes

Using the monitor console, you can view and interact with BP instances in both Project and Environment views.

- In Project view, you can start or stop a BP instance or set the cache.
- In Environment view, you can start, stop, and examine BP instances using the graphical model of the BP.

### BP Monitoring Tools

Interactive monitoring tools allow you to control the view of BP instances, and manage the display of instance details. The monitor console provides controls in toolbar format, across the top of the **Details** (right-hand) pane of the window.

### Tools for Controlling Display Modes

The display of BP instances and the Instance List in the console viewer are controlled by the buttons in the upper *left* of the Details window, described in the following table.

**Table 27** Display Modes

| | |
|---|---|
|  | **Hide Business Process** hides the rendered image of a BP instance so it does not appear the Details pane. |
|  | **Show Business Process** renders the image of a BP instance in the Details pane. |
|  | **Show Instance List** displays the attributes of the current BP instance in list format and adds the tools described in the following table. |
|  | **Hide Instance List** hides the attributes of the current BP instances and removes the instance tools from the interface. |

### Controlling the Display of Instance Data

When the monitor is in instance monitoring mode, you can manipulate the view of instance data using the buttons in the upper *right* of the Details window, as described in Table 28.

**Table 28** Monitor: Display Instance Data

| | |
|---|---|
|  | **Choose Preferences** allows you to add, move, and sort the columns in the BP instance. |
|  | **Start** starts a stopped BP instance. |

**Table 28** Monitor: Display Instance Data (Continued)

| | |
|---|---|
|  | **Stop** stops a BP instance. |
|  | **Filter Instances** allows you to set criteria to display a specific instance or group of Instances. |
|  | **Business Process Instance Attributes** displays the attributes of an Instance when the instance is selected in the **Instance List**. |
|  | **Activity Details** allows you to see the details of an Activity. Defines a step within a particular Business Process. when the Activity is selected in the **Instance List**. |

**Note:** *Online help for Enterprise Manager has additional information about monitoring business processes.*

## B.5 Logging

The eInsight engine coordinates all BP-related activity of a deployed project. The engine runs within the SeeBeyond Integration Server.

### B.5.1 Setting Logging Levels

You cannot set the logging level of the eInsight Engine from within the Business Process Instance Monitor. To set the log level, follow these steps.

**To set the eInsight logging level**

1. Using a text editor, open the **log4j.properties** file in the following folder: **<*JavaCAPS512_logicalhost*>/logconfigs/IS_integration-server-name**
2. Add the following line:

   ```
   log4j.category.com.stc.bpms.bpelImpl=<loglevel>
   ```

   The values for *<loglevel>* are:

   - Debug
   - Information
   - Warning
   - Error
   - Fatal

Appendix C

# SQL Reserved Words

Because eBAM supports several dialects of SQL, it warns you against from using certain reserved words as eBAM field names. Table 29 lists the words that are disallowed; it is a superset of several lists of words reserved by SQL and/or SQLPlus.

Using any of these words as field name, whether in uppercase, lowercase, or mixed case, will result in a warning message.

## C.1 SQL Reserved Words

**Table 29** SQL Reserved Words

| | | |
|---|---|---|
| ABORT | ABS | ABSOLUTE |
| ACCESS | ACTION | ADA |
| ADD | ADMIN | AFTER |
| AGGREGATE | ALIAS | ALIGNMENT |
| ALL | ALLOCATE | ALPHANUMERIC |
| ALTER | ANALYSE | ANALYZE |
| AND | ANY | ARE |
| ARRAY | AS | ASC |
| ASENSITIVE | ASSERTION | ASSIGNMENT |
| ASYMMETRIC | AT | ATOMIC |
| AUTHORIZATION | AUTOINCREMENT | AVG |
| BACKUP | BACKWARD | BASETYPE |
| BEFORE | BEGIN | BETWEEN |
| BIGINT | BINARY | BIT |
| BITVAR | BIT_LENGTH | BLOB |
| BOOLEAN | BOTH | BREADTH |
| BREAK | BROWSE | BULK |
| BY | C | CACHE |
| CALL | CALLED | CARDINALITY |
| CASCADE | CASCADED | CASE |

**Table 29** SQL Reserved Words (Continued)

| | | |
|---|---|---|
| CAST | CATALOG | CATALOG_NAME |
| CHAIN | CHAR | CHARACTER |
| CHARACTERISTICS | CHARACTER_LENGTH | CHARACTER_SET_CATALOG |
| CHARACTER_SET_NAME | CHARACTER_SET_SCHEMA | CHAR_LENGTH |
| CHECK | CHECKED | CHECKPOINT |
| CLASS | CLASS_ORIGIN | CLOB |
| CLOSE | CLUSTER | CLUSTERED |
| COALESCE | COLLATE | COLLATION |
| COLLATION_CATALOG | COLLATION_SCHEMA | COLUMN |
| COLUMNS | COLUMN_NAME | COMMAND_FUNCTION |
| COMMAND_FUNCTION_CODE | COMMENT | COMMIT |
| COMMITED | COMMUTATOR | COMPACTDATABASE |
| COMPLETION | COMPUTE | CONDITION_NUMBER |
| CONNECT | CONNECTION | CONNECTION_NAME |
| CONSTRAINT | CONSTRAINTS | CONSTRAINT_CATALOG |
| CONSTRAINT_NAME | CONSTRAINT_SCHEMA | CONSTRUCTOR |
| CONTAINER | CONTAINS | CONTAINSTABLE |
| CONTINUE | CONVERSION | CONVERT |
| COPY | CORRESPONDING | COUNT |
| CREATE | CREATEDB | CREATEFIELD |
| CREATEGROUP | CREATEINDEX | CREATEOBJECT |
| CREATEPROPERTY | CREATERELATION | CREATETABLEDEF |
| CREATEUSER | CREATEWORKSPACE | CROSS |
| CUBE | CURRENCY | CURRENT |
| CURRENT_DATE | CURRENT_PATH | CURRENT_ROLE |
| CURRENT_TIME | CURRENT_TIMESTAMP | CURRENT_USER |
| CURSOR | CURSOR_NAME | CYCLE |
| DATA | DATABASE | DATE |
| DATETIME_INTERVAL_CODE | DATETIME_INTERVAL_PRECISION | DAY |
| DDBC | DEALLOCATE | DEC |
| DECIMAL | DECLARE | DEFAULT |
| DEFERRABLE | DEFERRED | DEFINED |
| DEFINER | DELETE | DELIMITER |
| DELIMITERS | DENY | DEPTH |
| DEREF | DESC | DESCRIBE |

**Table 29** SQL Reserved Words (Continued)

| | | |
|---|---|---|
| DESCRIPTOR | DESTROY | DESTRUCTOR |
| DETERMINISTIC | DIAGNOSTICS | DICTIONARY |
| DISALLOW | DISCONNECT | DISK |
| DISPATCH | DISTINCT | DISTINCTROW |
| DISTRIBUTED | DO | DOMAIN |
| DOUBLE | DROP | DUMMY |
| DUMP | DYNAMIC | DYNAMIC_FUNCTION |
| DYNAMIC_FUNCTION_CODE | DYNASET | EACH |
| ELSE | ELEMENT | ENCODING |
| ENCRYPTED | END | END-EXEC |
| EQV | EQUALS | ERROR |
| ERRLVL | ESCAPE | EVERY |
| EXCEPT | EXCEPTION | EXCLUSIVE |
| EXEC | EXECUTE | EXISTING |
| EXISTS | EXIT | EXPLAIN |
| EXTENDED | EXTERNAL | EXTRACT |
| FALSE | FETCH | FIELD |
| FILE | FILLCACHE | FILLFACTOR |
| FINAL | FINALFUNC | FIRST |
| FLOAT | FLOAT4 | FLOAT8 |
| FOR | FORM | FORMS |
| FORCE | FOREIGN | FORTRAN |
| FORWARD | FOUND | FREE |
| FREETEXT | FREETEXTTABLE | FREEZE |
| FROM | FULL | FUNCTION |
| G | GENERAL | GENERATED |
| GET | GETOBJECT | GETOPTION |
| GOTOPAGE | GLOBAL | GO |
| GOTO | GRANT | GRANTED |
| GROUP | GROUPING | GTCMP |
| GUID | HANDLER | HASHES |
| HAVING | HIERARCHY | HOLD |
| HOLDLOCK | HOST | HOUR |
| IDENTITY | IDENTITYCOL | IDENTITY_INSERT |
| IDLE | IEEEDOUBLE | IEEESINGLE |
| IF | IGNORE | ILIKE |

**Table 29** SQL Reserved Words (Continued)

| | | |
|---|---|---|
| IMMEDIATE | IMMUTABLE | IMP |
| IMPLEMENTATION | IMPLICIT | IN |
| INCREMENT | INDEX | INDICATOR |
| INFIX | INHERITS | INITCOND |
| INITIALIZE | INITIALLY | INNER |
| INOUT | INPUT | INSENSITIVE |
| INSERT | INSTANCE | INSTANTIABLE |
| INSTEAD | INT | INTEGER |
| INTEGER2 | INTEGER4 | INTERNALLENGTH |
| INTERSECT | INTERVAL | INTO |
| INVOKER | IS | ISNULL |
| ISOLATION | ITERATE | JOIN |
| K | KEY | KEY_MEMBER |
| KEY_TYPE | KILL | LANCOMPILER |
| LANGUAGE | LARGE | LAST |
| LATERAL | LEADING | LEFT |
| LEFTARG | LENGTH | LESS |
| LEVEL | LIKE | LIMIT |
| LINENO | LISTEN | LOAD |
| LOCAL | LOCALTIME | LOCALTIMESTAMP |
| LOCATION | LOCATOR | LOCK |
| LOGICAL | LOGICAL1 | LONGBINARY |
| LONGTEXT | LONGVARCHAR | LOWER |
| LTCMP | M | MAIN |
| MAP | MATCH | MAX |
| MAXROWS | MAXVALUE | MEMO |
| MEMORYSET | MERGES | MESSAGE_LENGTH |
| MESSAGE_OCTET_LENGTH | MESSAGE_TEXT | MIRROREXIT |
| MIN | MINUTE | MINVALUE |
| MOD | MODE | MODIFIES |
| MODIFY | MODULE | MONEY |
| MONTH | MORE | MOVE |
| MUMPS | NAME | NAMES |
| NATIONAL | NATURAL | NCHAR |
| NCLOB | NEGATOR | NEW |
| NEWPASSWORD | NEXT | NO |
| NOCHECK | NOCREATEDB | NOCREATEUSER |

**Table 29** SQL Reserved Words (Continued)

| | | |
|---|---|---|
| NONCLUSTERED | NONE | NOT |
| NOTHING | NOTIFY | NOTNULL |
| NULL | NULLABLE | NULLIF |
| NUMBER | NUMERIC | OBJECT |
| OCTET_LENGTH | OF | OFF |
| OFFSETS | OIDS | OLD |
| OLEOBJECT | ON | ONCE |
| ONLY | OPEN | OPENDATASOURCE |
| OPENQUERY | OPENRECORDSET | OPENROWSET |
| OPENXML | OPERATION | OPERATOR |
| OPTION | OPTIONS | OR |
| ORDER | ORDINALITY | OUT |
| OUTER | OUTPUT | OVER |
| OVERLAPS | OVERLAY | OVERRIDING |
| OWNER | OWNERACCESS | PAD |
| PARAMETER | PARAMETERS | PARAMETER_MODE |
| PARAMETER_NAME | PARAMETER_ORDINAL_POSITION | PARAMETER_SPECIFIC_CATALOG |
| PARAMETER_SPECIFIC_NAME | PARAMETER_SPECIFIC_SCHEMA | PARTIAL |
| PASCAL | PASSEDBYVALUE | PASSWORD |
| PATH | PENDANT | PERCENT |
| PERM | PERMANENT | PIPE |
| PIVOT | PLACING | PLAIN |
| PLAN | PLI | POSITION |
| POSTFIX | PRECISION | PREFIX |
| PREPARE | PRESERVE | PRIMARY |
| PRIOR | PRINT | PRIVILEGES |
| PROC | PROCEDURAL | PROCEDURE |
| PUBLIC | QUIT | RAISERROR |
| READ | READS | READTEXT |
| REAL | RECALC | RECHECK |
| RECONFIGURE | RECORDSET | RECURSIVE |
| REF | REFERENCES | REFERENCING |
| REFRESH | REFRESHLINK | REGISTERDATABASE |
| REINDEX | RELATION | RELATIVE |
| RENAME | REPAINT | REPAIRDATABASE |

**Table 29** SQL Reserved Words (Continued)

| | | |
|---|---|---|
| REPEATABLE | REPLACE | REPLICATION |
| REPORTS | REQUERY | RESET |
| RESIGNAL | RESTORE | RESTRICT |
| RESULT | RETURN | RETURNED_LENGTH |
| RETURNED_OCTET_LENGTH | RETURNED_SQLSTATE | RETURNS |
| REPORTS | REQUERY | RESET |
| RESIGNAL | RESTORE | RESTRICT |
| RESULT | RETURN | RETURNED_LENGTH |
| RETURNED_OCTET_LENGTH | RETURNED_SQLSTATE | RETURNS |
| REVOKE | RIGHT | RIGHTARG |
| ROLE | ROLLBACK | ROLLUP |
| ROUTINE | ROUTINE_CATALOG | ROUTINE_NAME |
| ROUTINE_SCHEMA | ROW | ROWS |
| ROWCOUNT | ROWGUIDCOL | ROW_COUNT |
| RULE | SAVEPOINT | SCALE |
| SCHEMA | SCHEMA_NAME | SCOPE |
| SCREEN | SCROLL | SEARCH |
| SECOND | SECTION | SECURITY |
| SELECT | SELF | SENSITIVE |
| SEQUENCE | SERIALIZABLE | SERVER_NAME |
| SESSION | SESSION_USER | SET |
| SETFOCUS | SETOF | SETOPTION |
| SETS | SETUSER | SHARE |
| SHORT | SHOW | SHUTDOWN |
| SIMILAR | SIMPLE | SINGLE |
| SIZE | SMALLINT | SOME |
| SORT1 | SORT2 | SOURCE |
| SPACE | SPECIFIC | SPECIFICTYPE |
| SPECIFIC_NAME | SQL | SQLCA |
| SQLCODE | SQLERROR | SQLEXCEPTION |
| SQLSTATE | SQLWARNING | STABLE |
| START | STATE | STATEMENT |
| STATIC | STATISTICS | STDEV |
| STDEVP | STDIN | STDOUT |
| STORAGE | STRICT | STRUCTURE |

**Table 29** SQL Reserved Words (Continued)

| | | |
|---|---|---|
| STYLE | SUBCLASS_ORIGIN | SUBLIST |
| SUBSTRING | SUM | SYMMETRIC |
| SYSID | SYSTEM | SYSTEM_USER |
| TABLE | TABLEDEF | TABLEDEFS |
| TABLEID | TABLE_NAME | TABLES |
| TABLESET | TEMP | TEMPLATE |
| TEMPORARY | TERMINATE | TEXTSIZE |
| THAN | THEN | TIME |
| TIMESTAMP | TIMEZONE_HOUR | TIMEZONE_MINUTE |
| TO | TOAST | TOP |
| TRAILING | TRAN | TRANSACTION |
| TRANSACTION_COMMITTED | TRANSACTIONS_ROLLED_BACK | TRANSACTION_ACTIVE |
| TRANSFORM | TRANSFORMS | TRANSLATE |
| TRANSLATION | TREAT | TRIGGER |
| TRIGGER_CATALOG | TRIGGER_NAME | TRIGGER_SCHEMA |
| TRIM | TRUE | TRUNCATE |
| TRUSTED | TSEQUAL | TYPE |
| UNCOMMITTED | UNDER | UNENCRYPTED |
| UNION | UNIQUE | UNKNOWN |
| UNLISTEN | UNNAMED | UNNEST |
| UNTIL | UPDATE | UPDATETEXT |
| UPPER | USAGE | USE |
| USER | USING | VACUUM |
| VALID | VALIDATOR | VALUE |
| VALUES | VARBINARY | VARCHAR |
| VARIABLE | VARP | VARYING |
| VERBOSE | VERSION | VIEW |
| VOLATILE | WAITFOR | WHEN |
| WHENEVER | WHERE | WHILE |
| WITH | WITHOUT | WORK |
| WRITE | WRITETEXT | XOR |
| YEAR | YES | YESNO |
| ZONE | | |

# Index

## Numerics



## A



## B



## C



## D

## O



## P



## Q



## R



## S

## T



## U



## V



## W