

# **CA ERwin® Data Modeler**

## **Implementation Guide**

**r7.3**



**r7.3.8 SP2 Edition**



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## CA Product References

This document references the following CA products:

- CA ERwin® Data Modeler
- CA ERwin® Model Manager

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## Documentation Changes

The following documentation updates have been made since the last release of this documentation (r7.3 GA):

- r7.3.2 edition. Appendix B: Supported Metadata Integration Bridges—List of bridges was updated for MIMB 6.0.3.
- r7.3.8 SP2 edition. A note was added to the topic "Before You Install," indicating that Administrator privileges are required to install, upgrade, or remove CA ERwin Data Modeler.
- r7.3.8 SP2 edition. Appendix B: Supported Metadata Integration Bridges - List of bridges was updated for MIMB 6.0.5.



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# Chapter 1: Overview and Installation

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This section contains the following topics:

[Database Design Overview](#) (see page 13)

[Overview](#) (see page 13)

[Before You Install](#) (see page 14)

[Install CA ERwin Data Modeler](#) (see page 15)

## Database Design Overview

Welcome to CA ERwin Data Modeler (CA ERwin DM), the database design tool that raises the level of data quality in transactional and data warehouse systems. It provides the tools to design and implement databases for transactional business, E-commerce, and data warehousing applications.

You can create and maintain graphical models that represent databases, data warehouses, and enterprise data models. CA ERwin DM provides a modeling platform where corporate data requirements and related database designs can be defined, managed, and implemented across a wide variety of database platforms.

A Windows-based graphical user interface is combined with powerful entity-relationship (ER) diagramming tools, custom editors to define physical database objects, a Model Explorer for a text-based view of model objects, and support for the leading SQL and desktop databases.

Additionally you can use this product to streamline the application development process, by allowing different groups (Standards Administrators, Business Analysts, Data Modelers, and so on) to perform work independently, while collaborating and synchronizing. In this way, different groups can simultaneously work on various parts of a model or different model types.

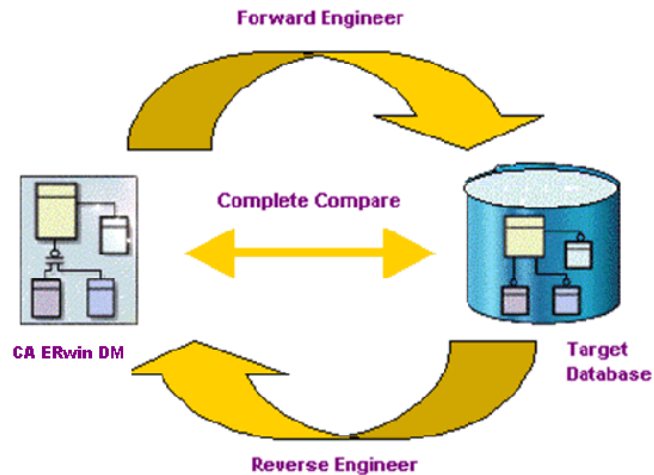
## Overview

CA ERwin DM combines a Windows-based graphical user interface with entity-relationship (ER) diagramming tools, and numerous innovative features. These features allow you to easily create and maintain your relational database and the logical and physical models that describe it. CA ERwin DM works by providing a design solution that helps you create a visual blueprint (a data model) for your organization.

CA ERwin DM is much more than a drawing tool. It not only helps you design a logical data model, which captures business rules and requirements, it supports the design of a corresponding physical data model for your target server. This enables you to forward engineer this physical data model and automatically generate physical database structures to your system catalog.

CA ERwin DM supports reverse engineering of existing databases and provides both a physical and logical/physical data model so you can maintain an existing database, or migrate from your current target server to a different one.

The Complete Compare technology automates model and database synchronization by letting you compare the model with the database, displaying, and analyzing the differences. This enables you to selectively move the differences into the model or generate them into the database.



## Before You Install

Review the hardware and software requirements and the list of supported target databases in the Release Notes file before you begin the installation.

### Administrative Privileges Required for Installation

Because the installation process for CA ERwin Data Modeler writes to the registry and system folders, the person installing, upgrading, or removing CA ERwin Data Modeler must have Administrative privileges. If you run an install without Administrative privileges, all files may not be installed or upgraded, and users will encounter problems when running the software.

## Install CA ERwin Data Modeler

The Installation Wizard makes it easy for you to install, change, or remove CA ERwin Data Modeler.

### To install CA ERwin Data Modeler

1. Insert the installation DVD or double-click the file you downloaded from the online CA product page.

The Installation Wizard opens.

2. Follow the prompts in the wizard to proceed. If you install from the DVD, you are prompted to select the applications you wish to change or install. Click Next.

A License Agreement opens for you to review.

3. Select the option to accept the terms as described in the License Agreement. Click Next.

The wizard asks a series of questions you must answer, including:

- Customer Information
- Destination folder for the CA ERwin DM files

4. On the Custom Setup Type screen, review the program features that will be installed. You can also evaluate the space needed to install each feature.

Click Next to continue and then click Install to start the installation.

The program files are copied.

If you have not already licensed CA ERwin Data Modeler, you can license the program when the install process is complete. Follow the on-screen prompts to open the License Verification dialog and enter the license key provided with the product CD.





# Chapter 2: Basic Concepts and Features

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This section contains the following topics:

[The Application Development Cycle](#) (see page 17)

[Basic Data Modeling Concepts](#) (see page 17)

[Create a Model](#) (see page 25)

[Enhance Your Data Model](#) (see page 29)

[Print a Data Model](#) (see page 36)

## The Application Development Cycle

Most data modeling solutions begin with the gathering of business rules and creating logical constructs and continues to the physical design phase followed by the implementation of a database that supports one or more applications. CA ERwin DM supports this iterative process by supporting multiple platforms, reuse of objects, and the ability to synchronize changes between data models across the enterprise.

## Basic Data Modeling Concepts

Before creating or working with data models, there are some basic data modeling concepts with which you should be familiar. These concepts include:

- Model Types
- Entities
- Tables
- Attributes and Columns
- Primary Key
- Relationships
- Foreign Key

## Model Types

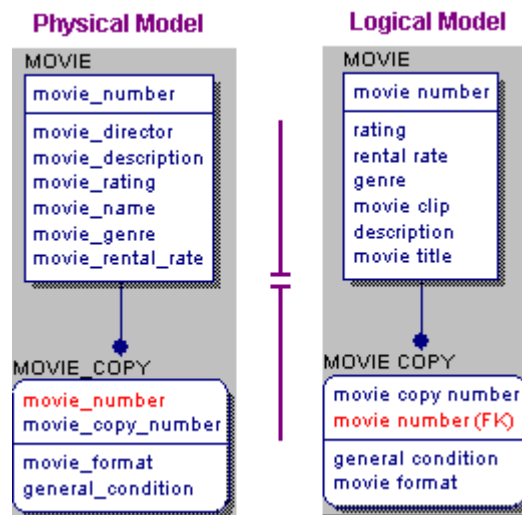
Multiple model types allow data modelers or data analysts to work with the models best suited for their needs. The following model types are available:

### Logical

A conceptual model that contains objects such as entities, attributes, and key groups.

### Physical

A database-specific model that contains objects such as tables columns and datatypes.



### Logical/Physical

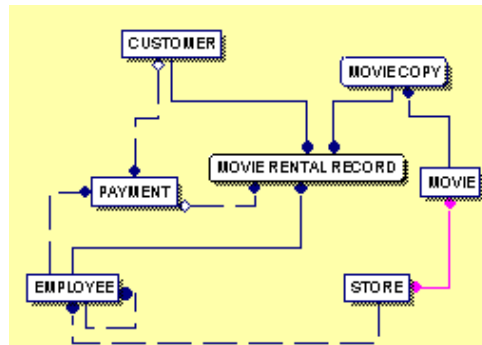
A single model that includes both the logical and physical models.

## Entities

An *entity* is a logical object that represents a person, place, or thing about which an organization maintains information.

In the following diagram, the logical data model has the following entities:

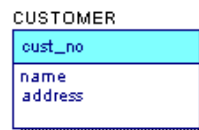
- CUSTOMER
- EMPLOYEE
- MOVIE
- MOVIE COPY
- MOVIE RENTAL RECORD
- PAYMENT
- STORE



## Tables

In the logical model, an entity usually corresponds to a table in the physical model. In the physical model, a graphic box represents a table in which data is stored in the database.

**Customer Table in ERwin**



**Customer Table in the database**

cust_no	name	address
1234	Brown	5 Main St
2345	Jones	129 C
3456	Smith	77 K

## Types of Entities/Tables

Two types of entities/tables can be drawn in a data model:

### Independent Entity

An entity whose instances can be uniquely identified without determining its relationship to another entity. It is represented as a box with square corners.

### Dependent Entity

An entity whose instances cannot be uniquely identified without determining its relationship to another entity or entities. It is represented as a box with rounded corners.

#### Independent Entity



#### Dependent Entity



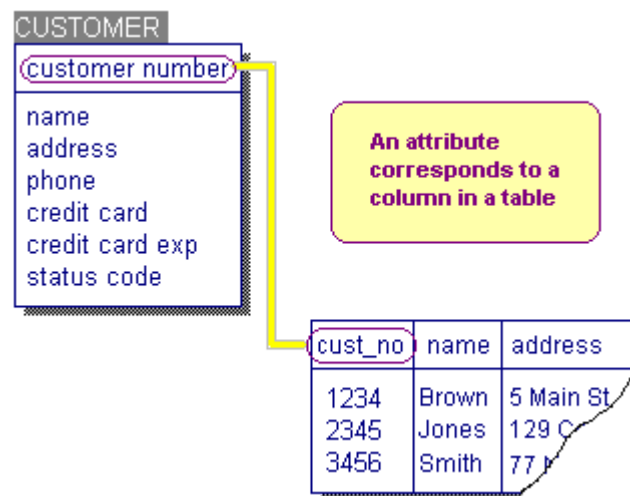
When you add an entity, the entity type is determined based on the relationship in which it is involved. For example, when you initially place an entity in a model, it is represented as an independent entity. When you connect the entity to another entity using a relationship, it is determined if the entity is independent or dependent based on the relationship type.

## Attributes and Columns

After you have discovered the people, places, and events that define the entities in your model, you can begin to define the attributes for each entity.

Attributes collect information about an entity and columns collect information about a table. Logical attributes usually correspond to physical columns in a table.

For example, after you create the CUSTOMER entity, you can begin to define the individual pieces of information you want to track for each customer, including Name, Address, and Phone Number. In the logical model, each of these pieces of information is saved as an attribute of the CUSTOMER entity. In the physical model, attributes equate to columns in a table.



**Note:** A row of data is inserted in a table when a record is added to the database directly or through an application.

After you create an entity or table, you can add attributes and columns, respectively.

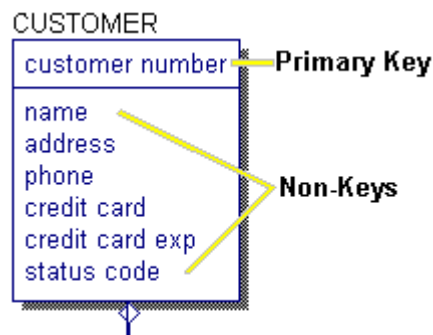
Many easy methods for creating and modifying the properties of these objects are provided. The most basic method is to add the name directly in the Diagram Window. You can also use a domain to add attributes and columns.

## Primary Key and Non-Keys

Entities and tables are drawn as a box with a horizontal line near the top of the box.

The area above the horizontal line is known as the *key area* because that is where the entity's *primary key* can be comprised of one or more attributes that uniquely identify the entity.

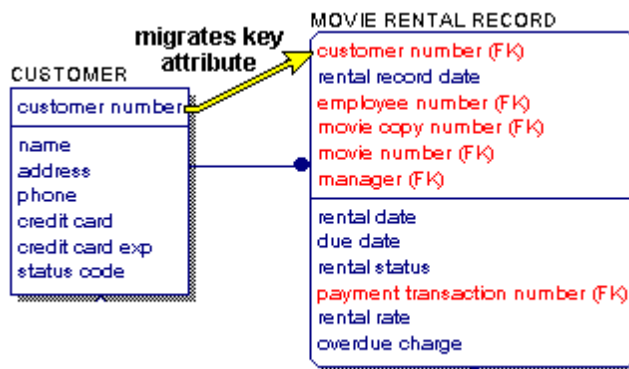
The area below the horizontal line is known as the *non-key area* because that is where all other attributes reside.



**Note:** A foreign key may appear in either the primary key or the non-key area of an entity or table. For more information about foreign keys, see the section Foreign Key in this chapter.

## Foreign Key

When you create a relationship between entities, the primary key attributes of the parent entity are automatically migrated to the child entity. The designator (FK) indicates the name of the migrated key attribute, also known as a foreign key. This migration occurs automatically in the physical model.

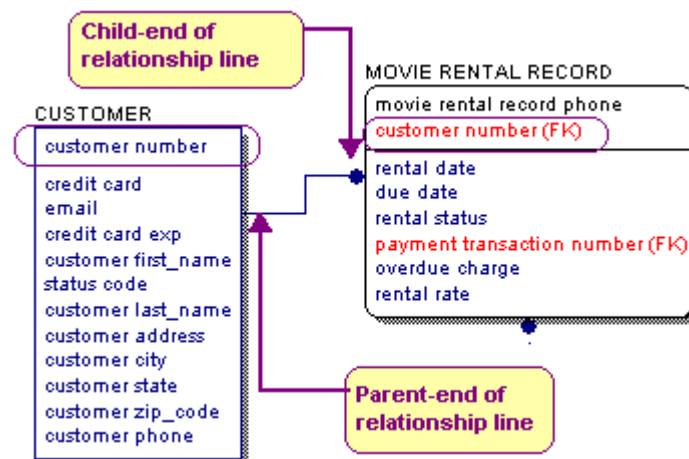


If the foreign key attribute has the same name as an owned attribute in the child entity, the two instances are automatically unified into one attribute because it assumes that they are the same attribute. The process of combining or unifying identical attributes in an entity is called unification.

**Note:** The foreign keys display in the physical model by default. To see the foreign keys in the logical model, choose Entity Display from the Format menu and check the options Show Migrated Attributes and Foreign Key Designator (FK).

## Relationships

An important object in a data model is the relationship, which is represented by the solid or dashed line that connects two entities or two tables. A relationship line connects a parent and a child entity or table. Usually, a symbol appears at the child-end of the relationship line. The symbol changes based on the diagram notation that you select.



## Types of Relationships

Relationships are important because the type of relationship determines how a primary key of the parent entity or table migrates to the child entity or table as a foreign key. There are two basic types of relationships:

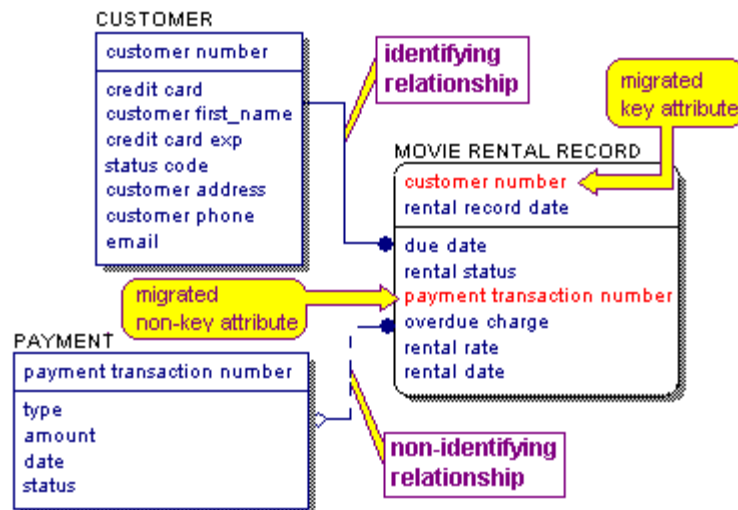
### Identifying Relationship

An identifying relationship is represented by a solid line and through it the primary key of the parent migrates to the primary key area of the child entity or table.

### Non-Identifying Relationship

A non-identifying relationship is represented by a dashed line and through it the primary key of the parent migrates to the non-key area of the child entity or table.

In an identifying relationship, the foreign key migrates above the line and becomes part of the primary key of the child entity (see the Foreign Key section of this chapter for more information). In a non-identifying relationship, the foreign key migrates below the line and becomes a non-key attribute in the child entity. A dashed line represents a non-identifying relationship.



**Note:** If you want a non-key to migrate instead of the primary key, you can use the alternate key migration option. For more information, see the online help.



## Create a Model

Now that you have a basic understanding of the workplace and the concepts associated with data modeling, you can begin creating a model.

### To create a model

1. Click New on the File menu.  
The Create Model - Select Template dialog opens.
2. Click Logical/Physical in the New Model Type group box, and select a template and target database. Click OK.  
A new Diagram Window opens.

## Name Your Model

When you create a new data model, you should also create a name, or title, for the model. This name is used throughout the Design Layer features to identify the model by name. If you do not change it, by default "model\_n" displays for all models. For example, the first model is named "model\_1", the second model is named "model\_2" and so on.

### To name your model

1. Click Model Properties on the Model menu.  
The Model Property dialog opens.
2. Enter the name you want to give the model on the General tab. You can also add the author's name in the Author field.
3. Click OK.  
The Model Property dialog closes.

**Note:** You can also enable Modeling Features and select Transform Options in this dialog.

## Add Entities

In the logical model, you can add entities using the ERwin toolbox.

### To add entities

1. Click the Entity tool in the toolbox.  
The cursor changes from an arrow to the entity symbol.
2. Click anywhere in the Diagram Window to place the first entity. By default, this entity is named E/1.  
Repeat Steps 1 and 2 to create as many entities as needed; they are named E/2, E/3 and so on.
3. Click Save As on the File menu to save your model.  
The Save As dialog opens.
4. Enter a name for the model and click Save.  
The model is saved with the .erwin file extension, and the Save As dialog closes.

**Note:** The entities that you created in the Diagram Window also appear in the Model Explorer and Action Log because all three areas of the workplace are automatically synchronized.

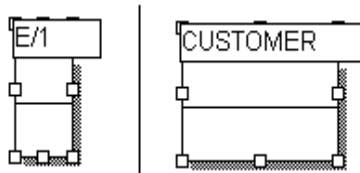
## Edit an Entity Name

You can edit an entity name by typing directly in the Diagram Window.

### To edit an entity name

1. In the Diagram Window, click on the entity named E/1. Wait briefly, then click again.  
An edit box appears around the name.
2. Enter CUSTOMER over the default entity name and click once outside of the edit box.

The entity is renamed.



The entity is renamed.

**Note:** You can also edit an entity name in the Model Explorer when you select and right-click the entity name.

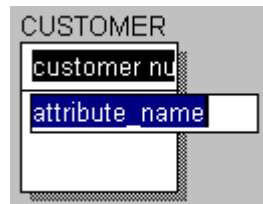
## Add Attributes

You can add attributes to the entities directly in the Diagram Window.

### To add attributes

1. In the Diagram Window, click an entity box and press Tab.

An edit box opens below the entity name with the default name, **attribute\_name**.



2. Enter the attribute name directly over the default name and click outside of the edit box.

The attribute is added.

**Note:** To add another primary key, before clicking outside the edit box, press Enter and the edit box opens above the line in the entity. To add a non-key, press Tab and the edit box opens below the line in the entity.

## Create Relationships

In the following exercise, we will add two relationships:

- An identifying relationship between a parent and child entity
- A non-identifying relationship between the entities ORDER and PRODUCT

### To create relationships

1. Click the Identifying Relationship tool in the toolbox.

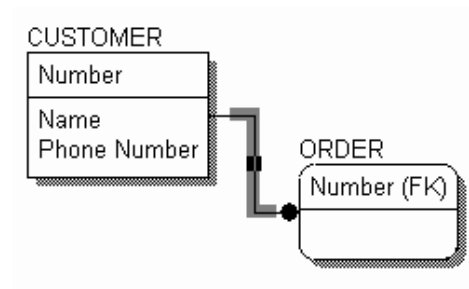
The cursor changes from the arrow symbol to the identifying relationship symbol.

2. Click the parent entity to begin setting an identifying relationship between the parent and child entity in the Diagram Window.
3. Click the child entity.

A highlighted relationship line connects the two entities.

**Note:** The relationship line is temporarily highlighted to make it easier to view the relationship. The relationship line is highlighted as you create it, or any time you select it.

When finished, your model should look similar to the following example:

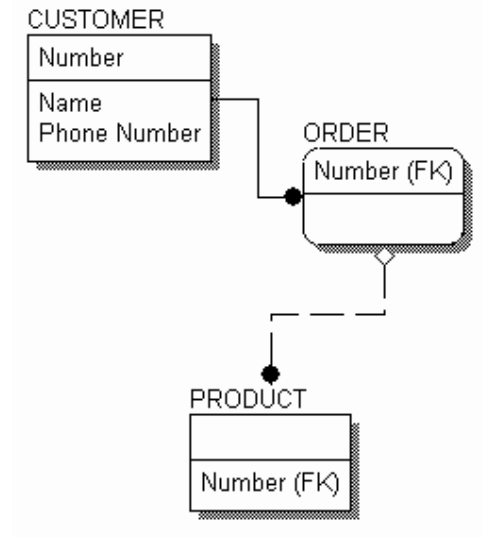


4. Click the Non-identifying relationship tool in the toolbox.

The cursor changes from the arrow symbol to the non-identifying relationship symbol.

- Click the parent entity and then click the child entity to add a non-identifying relationship between them.

When finished, your model should look similar to the following example:



## Save Your Model

To save the changes you made to your model, click Save on the File menu. You can open the file again later for editing.

## Enhance Your Data Model

When you design a data model, you can use many of the drawing features to enhance its appearance and make it easier to view and understand.

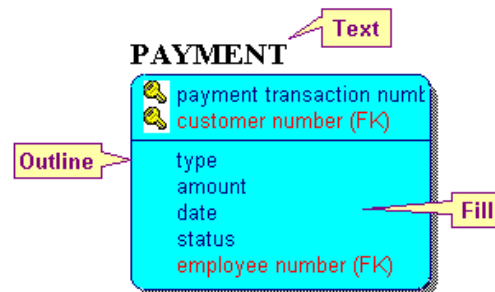
To prepare a diagram for analysis and presentation, you can:

- Enlarge the font size for all entity names so that they are easier to read.
- Change the color of all foreign keys to red, so that they are distinguishable from other attributes or columns.
- Use different fonts and colors to identify new objects from old objects in your model.
- Resize one or more entity boxes
- Align two or more entity boxes

## Graphic Features

A diagram has several types of graphic elements that you can enhance with color. For example, you can specify text, fill, and line sizes and colors for entities, attributes and relationships.

In addition to these graphic elements, there are many object types that you can change globally such as Foreign Keys, Entity Names, and Owned Keys.



## Customize Object Fonts and Colors

When you add an object to a diagram, the default font and color for that object type is automatically assigned. Use the following procedure to customize the default fonts and colors for the objects you create.

### To customize object fonts and colors

1. Click Default Fonts & Colors on the Format menu.

The Default Fonts & Colors dialog opens.

2. Navigate the tabs on the dialog to set default color and font information. You can also specify font and color properties for all model objects, new objects you create, or current objects in the model.

**Note:** The tabs that appear vary depending on whether you are working with a logical, physical, or logical/physical model.

Click OK.

The new default settings are saved and the dialog closes.

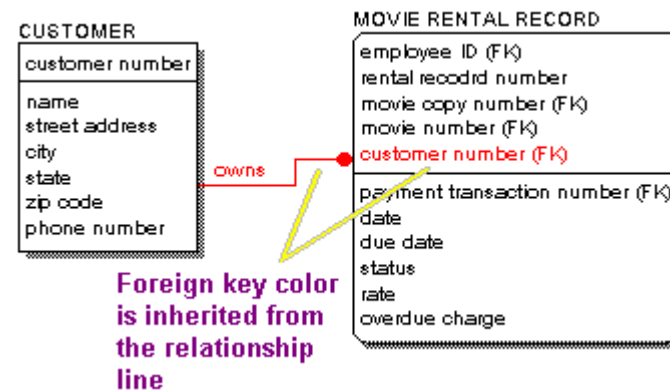
## Font and Color Change for Individual Objects

You can also change the color or font of individual objects in your diagram in the following ways:

- Select the object, then click an option in the Font and Color Toolbar
- Select the object, then right-click and select Object Font & Color on the shortcut menu.

## Objects Can Inherit Color

The color of an object can be related to the color it inherits from other objects in the diagram. For example, you can choose to have a foreign key attribute or column, inherit its font and color from its parent primary key or relationship.



You can also change the color of foreign key columns or attributes so that you can easily identify them from owned primary key columns or attributes.

## Add a Text Block

You can add text blocks to a diagram to identify or clarify model elements. Text blocks can include any text you choose including diagram version numbers, notes, titles, and captions. You can add consecutive multiple text blocks by pressing the CTRL key before you click the text block tool. When you click again in the diagram window, another text block is created. If you add text blocks this way, you first create multiple empty text areas and then must return to each text area to enter the text.

### To add a text block

1. Click the Text icon on the Drawing Objects toolbar.  
The cursor changes from the arrow symbol to the text symbol.
2. Click the diagram window where you want the text block to appear.  
A new text block is created.
3. Type the text that you want to appear in the text box, and click the diagram window outside the text block.  
The text block closes and your changes are saved.

**Note:** You can press Tab to include tabs in the text. You can also press Enter to include line breaks in the text. In addition, you can copy and paste text in text blocks.

## Resize a Box

To enhance the appearance of your data model, you can make all of the entity, table, or view boxes uniform in size. You can also emphasize one or two boxes by making them larger than the others, or resize any box to meet your presentation requirements.

**Note:** Click Preferences on the Format menu to change the default for this option. You can select or clear the Allow manual resize check box on the Layout tab of the Format Preferences dialog for this feature.

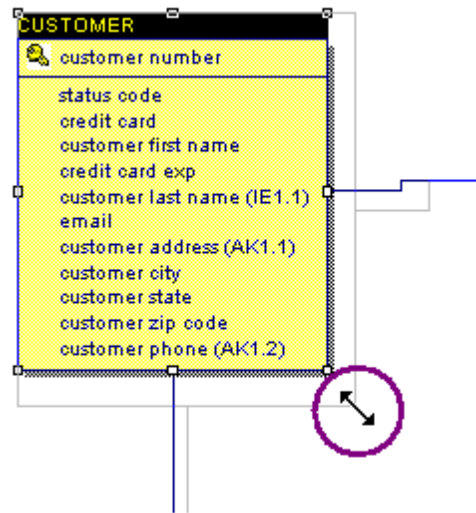


**To resize a box**

1. Use the Select tool, and click near the border of the box that you want to resize.

The resize handles appear.

2. Move the Select tool until you see the cursor shape change into a two-sided arrow.



Hold down the mouse button and grab the resize handle. Move the cursor to adjust the height or width of the box.

Release the mouse button when you are satisfied with the new dimensions of the box.

The box is resized.

## Object Arrangement

Some of the automatic layout features help you arrange objects in your diagram. The alignment toolbar helps you quickly align the object boxes along the top, bottom, or sides of the boxes.

The alignment toolbar includes tools to evenly space a set of objects horizontally or vertically.

## Adjust the Object Spacing on the Diagram Window

Use this automatic layout feature to quickly adjust the horizontal and vertical space between objects.

### To adjust the object spacing on the diagram window

1. Select the objects for which you want to adjust the space. You must select at least three objects.
2. Choose one of the following on the Alignment toolbar:



#### Space Horizontally

Spaces the objects horizontally.



#### Space Vertically



Spaces the objects vertically.

## Group and Ungroup Objects

You can group objects to easily maintain and manage your models. For example, you may want to group all the entities that you work with by category. When you create groups, it also helps ensure that single entities will not be inadvertently moved.

**Note:** To adjust alignment or spacing within the group, you must first ungroup the objects.

### To group and ungroup objects

1. Select the objects that you want to group
2. Click the Group icon  in the Alignment Toolbar.  
You can now move the group around the model as single object.
3. To return the group to individual movable objects, select the group and then click the Ungroup  icon in the Alignment Toolbar.  
You can now move each object individually.

## Drawing Objects

You can enhance a model by using the Drawing Objects Toolbar to create the following objects:

- Rectangle
- Rectangle with rounded corners
- Ellipse
- Line
- Polyline (line with many corners)
- Polygon
- Text box

In any drawing object, you can change text, font, and color properties, by double-clicking on the object to open the Drawing Objects dialog.

## Add Drawing Objects to a Data Model

You can add drawing objects to a data model to enhance it or to provide meaningful annotations.

### To add drawing objects to a data model

1. Open the model to which you want to add a drawing object. Click the shape icon on the Drawing Objects toolbar, and draw the shape around one or more entities.

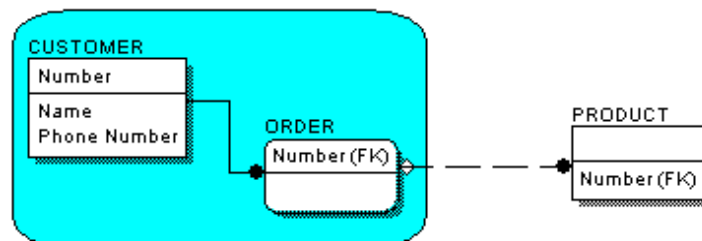
The shape is drawn around the chosen objects.

2. Click the arrow on the Apply Background Color tool on the Font and Color toolbar.

A new window opens to display the available colors.

3. Choose any color to apply to the background of the shape.

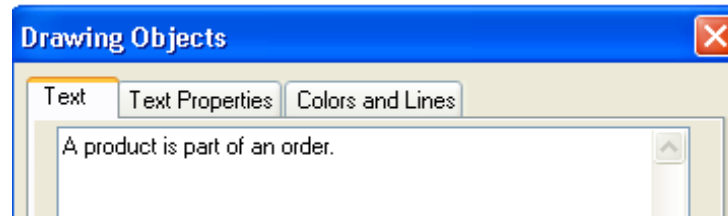
The color is applied to the background of the selected objects.



4. Double-click on a drawing object you created.

The Drawing Objects dialog opens.

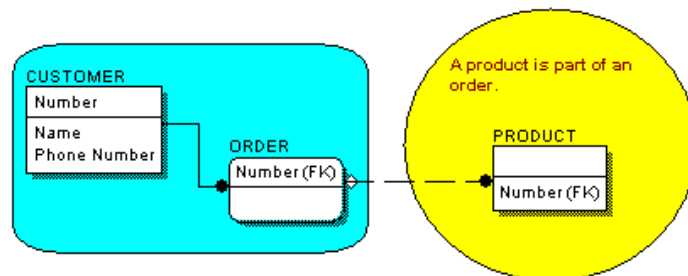
5. Click the Text tab and enter your annotation in the text box:



The text appears.

6. Click the Text Properties tab and, select a color for the text, and click OK.

The dialog closes and you can see the annotation in the drawing object. The following is an example of how you can use drawing objects to enhance your data model:



7. Click Save on the File menu.

Your work is saved.

## Print a Data Model

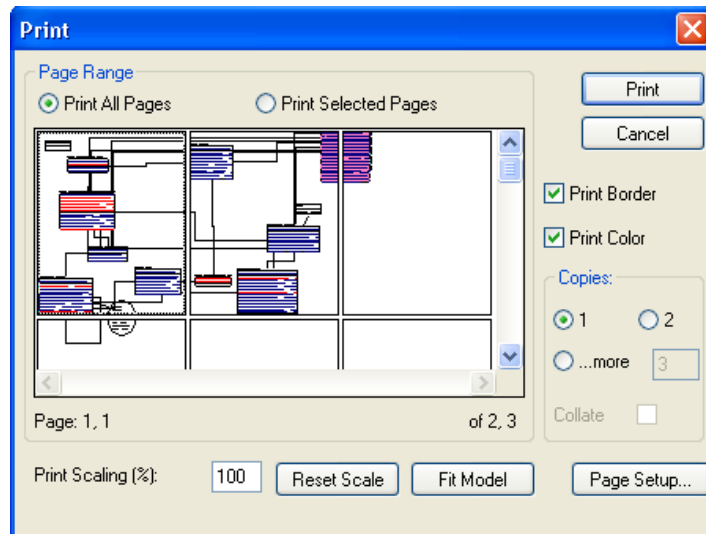
You can print your model at any stage of development to use it as a visualization tool.

### To print a data model

1. Click Print on the File menu.

The Print dialog opens, and includes an embedded Diagram Window that lets you view the data model by page.

2. Change any of the following options on this dialog:
  - Print scaling
  - Number of pages you want to print
  - Format options, such as borders and color printing
  - Page setup options such as margins, headers, and footers



3. Click Print.

## Print Only What You Want

You can use the mouse in the embedded Diagram Window in the Print dialog to perform the following tasks:

### Change the print scale

Drag a page grid line until your model fits in the grid pages exactly how you want the model pages to print. You can also enter a value in the Print Scaling box.

### Select specific pages for printing

Hold the CTRL key and click each page you want to print.

## Set Print Margins

You can specify margins for all pages of your printed model.

### To set print margins

1. Click Page Setup in the Print dialog.  
The Page Setup dialog opens.
2. Click the Margins tab.
3. Enter a value between 0 and 1.5 inches for the left, right, top, and bottom of the page.
4. Click OK.  
The Page Setup dialog closes.

**Note:** Margin measurements are considered when displaying the embedded Diagram Window in the Print dialog.

## Add a Page Header or Footer

You can add a customized header or footer (or both) to all the pages when you print a model. For example, you can print the Model Name, Subject Area, and Stored Display at the top of every page and the page number and date and time at the bottom of every page.

Keep in mind that if you manually enter incremental information in the Header or Footer text box (for example, page number, date, and so on), you cannot automatically update the text.

### To add a page header or footer

1. Select Print on the File menu.  
The Print Model dialog opens.
2. Click the Page Setup button.  
The Page Setup dialog opens.

3. Select the Header/Footer tab at the top of the Page Setup dialog.

In the Header/Footer section.

- Click in the Header or Footer text box to specify in which area you want to insert the customized text.
- Click the appropriate Header/Footer button to automatically insert information (grid page numbers) or use the keyboard to insert other information (for example, your name).

Click OK.

The settings with the current stored display are saved and you return to the Print Model dialog.





# Chapter 3: Understanding the Workplace

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This section contains the following topics:

[Toolbars](#) (see page 41)

[Workplace Panes](#) (see page 46)

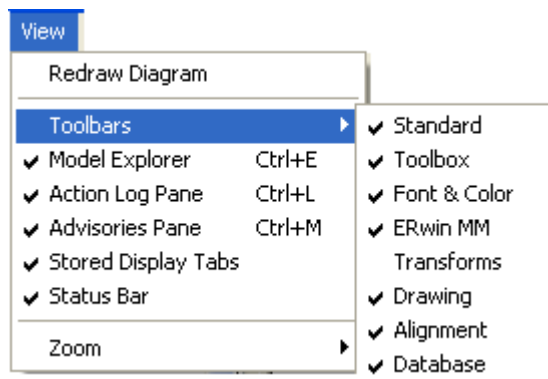
[Property Editors](#) (see page 73)

## Toolbars

There are many task-oriented toolbars that help you quickly perform popular tasks. When you pass your cursor over the toolbar button, a brief description of the button appears. When you click it, the appropriate dialog opens or the task is performed.

All of the toolbars are dockable. That means that you can drag them to any location in the workplace and they dock along the edge of the window. Alternatively, you can let them float freely in the window if you prefer.

Depending on your preferences, all of the toolbars may be shown or hidden. On the View menu, the Toolbars option lists all of the toolbars. Select (check) a toolbar to make it visible in the workplace and clear (uncheck) to hide it. In the following example, you can see that the Transforms toolbar is not selected and will not display in the workplace:



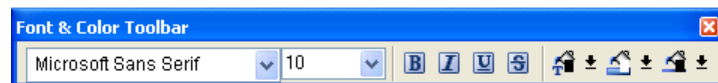
## The Main Toolbar

The Main toolbar is located near the top of the diagram window, and contains a group of buttons that you can use to perform common tasks. Each toolbar button is a shortcut you can use instead of selecting a menu option. The availability of the toolbar varies, depending on the object you have selected and whether you are working on the logical or physical model.

When you pass your cursor over a toolbar button, you will see a brief description of the button. When you click it, the appropriate dialog opens or the task is performed automatically.

## Font & Color Toolbar

You can use the Font and Color toolbar to change the font or color of objects on the Diagram Window. The toolbar lists all the fonts that are available on your workstation. It also has separate buttons to modify the color of the text, object, and outline color.



Options include:

- Font Style
- Font Size
- Bold Text
- Italic Text
- Underline Text
- Strikeout Text
- Apply Text Color
- Apply Background Color
- Apply Outline Color

## Drawing Objects Toolbar

You can enhance a model by using the Drawing Objects Toolbar to create the different drawing objects. The tools work like many other popular point-and-click drawing applications. Just click a tool, click in the Diagram Window, and drag the mouse until the object is the right size.



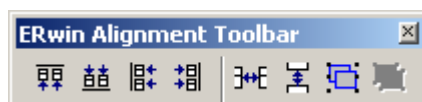
**Note:** You can assign default font and color settings for drawing objects. Click Default Fonts and Colors on the Format menu. Click the Drawing Objects tab on the Default Fonts and Colors editor to select the default setting for drawing objects.

## Alignment Toolbar

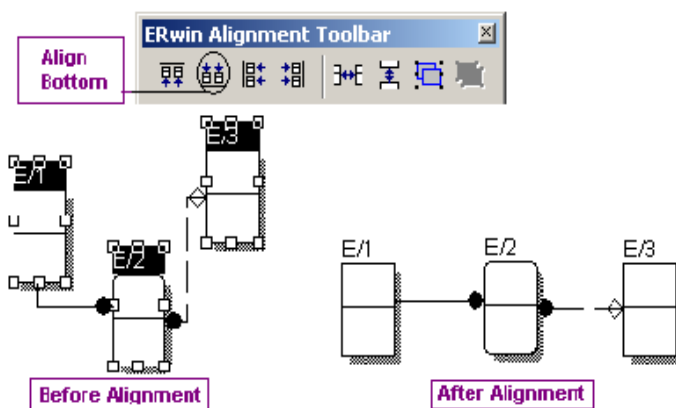
The appearance of your data model is important to you and the others who use it. There are many features that help you enhance the appearance of your model. You may already be familiar with some of the automatic layout features that help you arrange objects in your diagram.

A toolbar is provided that can help you quickly align the object boxes along the top, bottom, or sides of the boxes. The same toolbar includes tools to evenly space a set of objects horizontally or vertically.

The tools on the Alignment Toolbar speed the process of graphically arranging and grouping model objects.



You can select multiple diagram objects, and space them to your preference. Similarly, the Group tool lets you group multiple diagram objects for easy manipulation.



## CA ERwin Model Manager Toolbar

The CA ERwin Model Manager toolbar lets you perform administrative and workgroup-related tasks in CA ERwin Model Manager (CA ERwin MM). A ToolTips description of each toolbar button displays when you pause your cursor on it.

**Note:** Options on the toolbar become active only after you make a connection to the CA ERwin MM database.



Options include:

- Open an CA ERwin MM Model
- Save an CA ERwin MM Model
- Lock/Unlock an CA ERwin MM Model
- Manage CA ERwin MM Libraries
- Manage CA ERwin MM Submodels
- Merge CA ERwin MM Models
- Refresh a CA ERwin MM Model
- Review Changes to a CA ERwin MM Model
- Display CA ERwin MM Model Differences
- Connect to CA ERwin MM
- Set CA ERwin MM Permissions
- Synchronize Models

## The ERwin Toolbox

The toolbox is the primary set of tools for drawing and editing a data model. In the Toolbox, use the Select tool to move objects and resize entity and table boxes. The cursor changes shape for each task so that you know what action is performed.



You have the option to resize any box to meet your presentation requirements. For example, you may want all of the entity, table, or view boxes to be uniform in size, or emphasize one or two boxes by making them larger than the others.

The toolbox changes based on the model type (logical or physical) and the notation (IDEF1X, IE, or DM).

For more information about the IDEF1X, IE, and DM notation, see the online help.

## Workplace Panes

Each of the following panes within the workplace is dockable and floatable, and each contains their own toolbars:

- Advisories Pane
- Model Explorer
- Action Log

Each pane also contains a shortcut menu. When you right-click on the double lines at the top of each pane or right-click on the toolbar found on the pane, a shortcut menu displays the following options:

**Allow Docking**

Keep the pane in its current position

**Float In Main Window**

Lets the pane move over to the Diagram Window

**Hide**

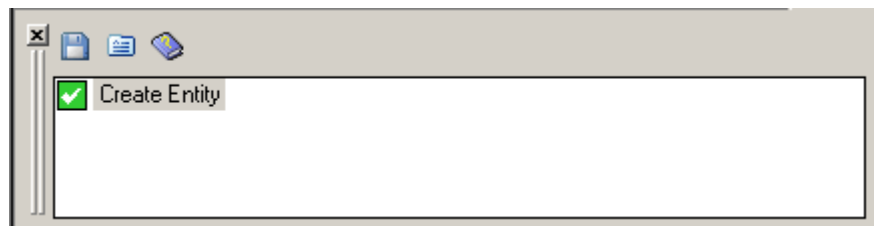
Conceals the pane, select this option. To view the pane again, select the appropriate pane from the View menu.

In addition to using the shortcut menu to hide any of these panes, you can use one of the following methods:

- Clear the appropriate option on the View menu
- Click the Close button in the upper left corner of the pane

## Advisories Pane

The Advisories pane is a dockable, floatable window in the main workplace. This pane automatically appears when you start the program.



The Advisories pane displays messages associated with actions you perform when working with your model. Each message on this pane shows you when a change or edit you make to a property is valid and alerts you when the action you have taken violates a modeling rule. When alerted, you can immediately correct your action instead of searching for the transaction at some later time.

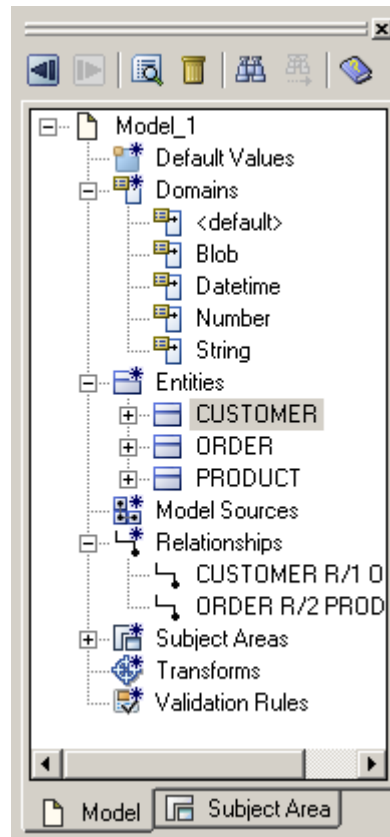
In addition to viewing the valid and violation messages, you can obtain details about a specific action that generated the message. For example, if you set a property, the Advisories pane shows a "Set Property" message. Click the Details button on the Advisories toolbar to display the Advisories Details dialog and get more information about the property. This feature is particularly useful when are working with a large model and you need clarification about that particular action.

## Model Explorer

The Model Explorer provides an organized, hierarchical, text-based view of your data model and its contents. It provides an easy method for creating objects. The Model Explorer enables you to create, display, navigate, and modify your model using the Model or Subject Area view.



The Model Explorer has two panes, Model and Subject Area. You can switch to a different pane by clicking the tab at the bottom of the Model Explorer:



All of the objects in your model are listed in the Model Explorer, but display differently based on which pane is active.

- The Model pane includes every object in your model including subject areas and domains. This is the default view.
- The Subject Areas pane displays model objects sorted by subject area.

## Dynamic Changes

Just as you can work on a graphical view of a model in the Diagram Window, you can perform the same tasks from the Model Explorer using a text-based view of a model. When you make changes to an object in the Model Explorer, the graphical view of the model is immediately updated with the same change.

For example, if you rename a table in the Model Explorer, the new table name replaces the existing table name in the Diagram Window and the relevant editors. Similarly, if you make a change to the diagram or in an editor, you immediately see the change in the Model Explorer.

## The Model Explorer Tasks

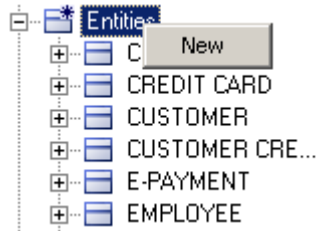
In addition to navigating, the Model Explorer provides a whole range of useful features that help you easily create and modify your data model such as:

- Create new objects
- Go to objects in the Diagram Window
- Open editors to view or change object properties
- Delete objects
- Rename objects

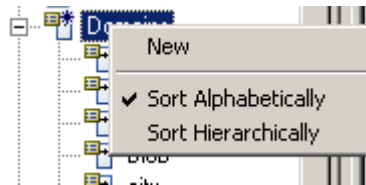
**Note:** To work with the Model Explorer, click the Model Explorer option on the View menu.

## The Model Explorer Shortcut Menu

When you right-click on an object in the Model Explorer, a shortcut menu displays that lists the options available for that object, similar to the following example:



To control the topological display of Domains, right-click on a Domain and select how you want to sort the Domains.



You can also delete an object or invoke the property editor for the object. If semantics do not allow the deletion of an object (such as a Primary Key object), then the Delete menu item on the shortcut menu does not appear.

If you want to create a new object, and additional information is required to complete the creation of that object (such as a Relationship), a dialog box appears in which you must enter the information required.

## The Model Explorer Toolbar

The Model Explorer contains a toolbar to help you navigate your object editing, launch property editors, delete objects, search for text, and invoke online help.



## New Objects

Just as you can create a new entity, table, or relationship using the Toolbox, you can quickly create a new object in the Model Explorer.

To create a new object, right-click on any object and choose New from the shortcut menu. For some objects, such as a domain, you can drag the object from the Model Explorer onto the Diagram Window to create a new attribute or column.

## Rename Objects

Every object in your model is represented in the Model Explorer by its name. Just as you can rename an object using on-diagram editing in the Diagram Window, you can rename an object directly in the Model Explorer.

### To rename objects

1. Click the object name, and then click again.

An edit box opens around the object name.

2. Enter the new object name directly in the edit box.

The new name of that object appears throughout the Model Explorer and the model.

**Note:** Any unique name rules that you select for your model are enforced when you rename an object in the Model Explorer.

## Select Unique Name Rules

Unique name rules are a set of options that define how to respond when you have a duplicate entity or table name in the data model.

### To select unique name rules

1. Click Names on the Tools menu, then click Model Naming Options on the submenu.

The Model Naming Options dialog opens.

2. Click the Duplicate Names tab.

Select the options you want to apply.

3. Click OK.

Your changes are saved and the Model Naming Options dialog closes.

## The Go to Diagram Option

When you right-click an entity, table, or view in the Model Explorer and click the Go To Diagram option from the shortcut menu, you can quickly display that object in the Diagram Window.

## Object Properties

Each object in a data model has many properties. The easiest way to add or modify object properties is in the object property editor.

Using the Model Explorer, you can open the Property editor for that object type. You can do this in one of two ways:

- Right-click on the object and click Properties.
- Select the object and click the Property Editor button from the Model Explorer toolbar.

When the Property Editor opens, you can accept or change the default properties. When you close the editor, the properties are saved with the object.

Regardless of the method you choose to add or edit an object or its properties, the Model Explorer and the data model are always in sync. While you are still in the design phase, the names of objects in your model may change frequently.

**Note:** Object properties also migrate through relationship lines. In other words, objects can inherit properties from their parent objects.

### Object Moving, Copying, and Deleting

Just as you can move, copy, and delete attributes and columns in the Diagram Window, you can also move, copy, and delete most objects in the Model Explorer.

After you move, copy, or delete an object, all of the instances in the model that reference that object are updated automatically.

### Add a Domain in the Model Explorer

In the Model Explorer, the Model view lists all of the domains for the current model, which include all of the default domains as well as any that you created.

#### To add a domain in the Model Explorer

1. Right-click a domain type (blob, string, number, and so on).  
A shortcut menu opens.
2. Click New.

An edit box opens with a default domain name.

**Note:** The selected domain type is assigned as the parent.

3. Enter a name for the domain in the text box and press Enter

The new domain appears according to the sort order that you specify (either alphabetically or hierarchically).

**Note:** To switch the sort order of the Domains from hierarchical to alphabetical, right-click on the Domains folder in the Model view, and select the sort option that you prefer.

For more information about domains, see the “Working with Data Models” chapter.

### Add a Model Source in the Model Explorer

When you work with design layers, it may be important to link a model with its model source so that you can identify the historical parent of a model. After you link a data model to its source, you can synchronize the two models to selectively apply changes to one or the other.

#### To add a model source in the Model Explorer

1. Right-click the Model Sources Folder, then click New from the shortcut menu.

The Add Model Source wizard opens.

2. Follow the steps in the Add Model Source wizard to finish adding the model source.
3. Click Add to complete the process and close the wizard.

The source objects are added to your target model, and models are linked. As you continue to work with the models, all the changes you apply to the model and the model source are tracked.

For more information about adding model sources, see the “Working with Design Layers” chapter.

## Model View

The primary purpose of the Model view is model exploration and to function as an alternative launching point for object and property editors. It lists all of the object types that appear in the current data model based on the model type and the target server.

For example, if the model type is Logical, the Model Explorer does not include physical objects such as a view. Similarly, if the model type is Physical, the Model Explorer does not include logical objects. If the target server is Oracle, then additional objects specific to Oracle display, such as Clusters.

Other objects that do not display are:

- Minor objects that are handled completely by the editors of the parent object. For example, a Valid Value object is created, destroyed, and edited by the Validation Rule editors.
- An object that represents configuration information that is stored by an CA ERwin DM process, and is not actual model data, such as a Complete Compare Option Set.

## Subject Area View

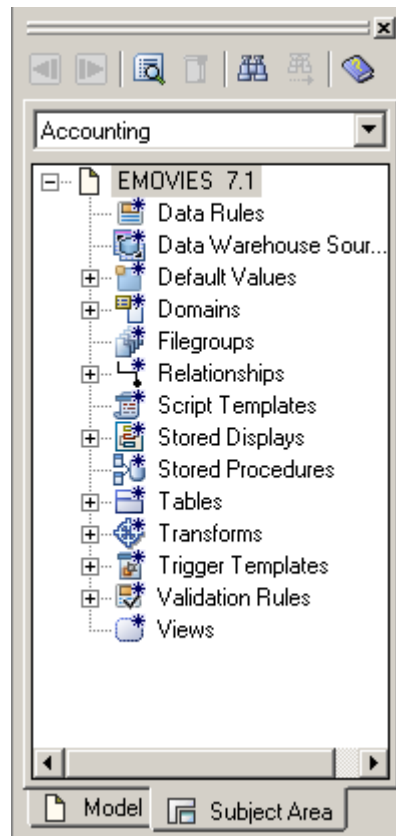
The Subject Area pane displays model objects sorted by subject area. You can expand each subject area to see a list of the members as well as any stored displays, which appear in folders below the Subject Area to which they belong.

The purpose of the Subject Area view is to provide a filtered view of the model so that unnecessary tree information is minimized, which is especially helpful when you are working with large models.

By default, every data model has a Main Subject Area, which includes all of the objects in the model. You can create other subject areas to divide the model into smaller manageable parts.



At the top of the Model Explorer is a drop-down list where you can select the subject area that you need. When you select the subject area, the contents of the tree control in the Model Explorer filters so that only those objects that are contained within the selected subject area, or those that are global, are shown.



For example, you see that tables are categorized as tables, and views categorized as views, unlike the display of subject area objects in the Model tab view. Relationships are filtered to show only those visible on the diagram if both endpoints are present in the subject area. You can expand the tree for the subject area to see the subject area members.

**Note:** Global objects that do not relate to the selected subject area are not displayed, such as subject area objects or model source objects.

### Create a New Subject Area

You can create a new subject area in the Model Explorer.

#### To create a new subject area

1. Click the Model tab. You must be in the Model view to create a new subject area.
2. Right-click the Subject Areas node and click New on the submenu.

A text box opens at the bottom of the list.

3. Enter the name of the new subject area in the box, and click outside the text box.

The new subject area is named.

To add members to a new subject area, drag entities or tables from the Main Subject Area into the new subject area.

**Note:** Subject area members just reference the objects in the Main Subject Area, so changes automatically apply to an object in every subject area in which it is a member.

## Action Log

The Action Log works in real time so you can make modeling decisions during your current session rather than having to wait until you save the model to review changes. The Action Log lets you determine the best way to work.

**Note:** To work with the Action Log, select the Action Log Pane option from the View menu.

As you work on the graphical view of a model in the Diagram Window, you can view the transaction information in the Action Log. As you make changes to your model, the Action log is updated in real time. For example, if you create an entity in your model, the Action Log reflects this change.

Changes are only viewable in the Action Log during your *current modeling session*. Each new session begins with an empty Action Log. When you close the model, the Action Log clears. Before closing your model, you can generate a report that lets you view all the changes made during the current session.

The type of objects that appear in the Action Log is based on the display mode you are using. If you are working with a logical model, then only logical objects appear. If you are working with a physical model, then only physical objects appear.

The Action Log lets you search for every transaction and filter by type of change so that you can easily find a specific transaction or a set of transactions. This feature is particularly helpful when working with large models.

## Action Log Panes

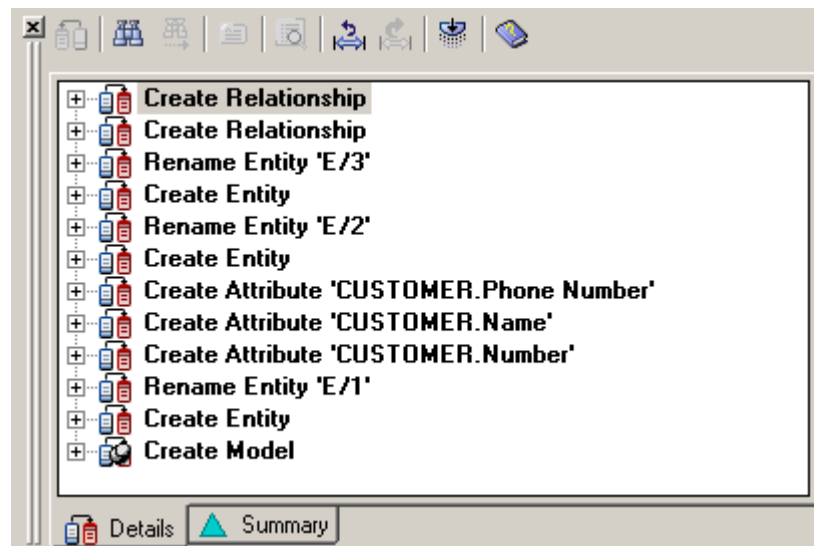
The Action Log has two panes, Display and Summary, with corresponding tabs. Select the Details tab to see every change (*transaction*) made to a model, or select the Summary tab to see the net result of changes made to a model.

**Note:** A transaction is a single unit of work that is not divisible into smaller components. The Action Log lets you navigate through the transaction tree using the Details pane or the Summary pane.

## Details Pane

The Details pane shows all the changes you make to a model during the current session. The Details pane is the default view when you launch the program. Changes appear in the Details pane with the most recent transaction at the top of the tree, and the first transaction at the bottom of the tree. You can either expand or collapse each transaction.

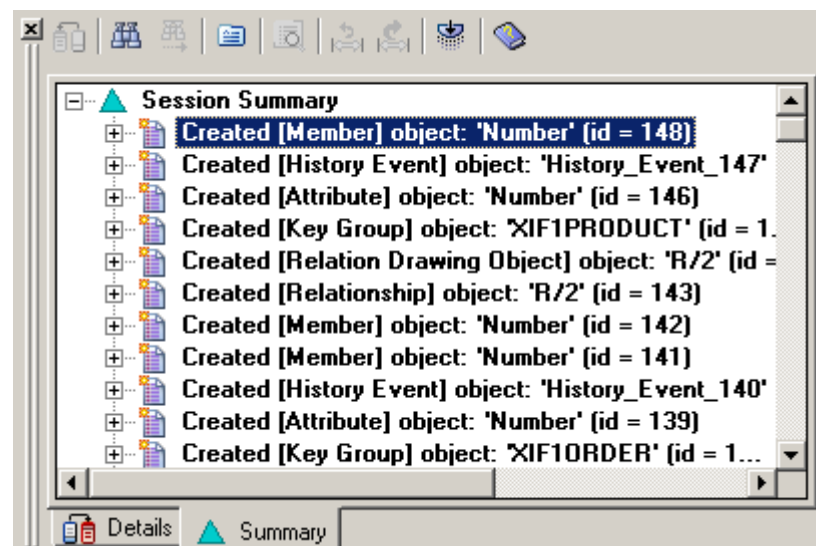
The toolbar on the Details pane lets you reverse a transaction, find a transaction, view property details, and undo and redo to a selected transaction while working in the current session.



## Summary Pane

The Summary pane displays the net result of changes made to the model during the current session. It provides a filtered view of all the actions you perform on the model during the current session so that unnecessary tree information is minimized, which is especially helpful when you are working with large models.

The Session Summary node is the top-level node in the tree. All changes you make to the model at the object level and property level appear below the Session Summary node in the tree.



The Summary pane is similar to the Details pane except for the following differences:

- While the top-level nodes in the Details pane are *transactions*, the Summary pane has only one top-level node with changes appearing below it.
- The Extended Find and Filter feature is only available in the Summary pane.
- The Reverse, Undo to Selected Transaction, and Redo to Selected Transaction options are not available in the Summary pane.

## Action Log Tasks

In addition to viewing the detail and summary transactions, the Action Log provides a range of useful features that help you easily perform the following actions:

- Locate text within a transaction, object, or property using the Find feature.
- Use the Extended Find and Filter feature to locate, filter, and report on the results of your search. This feature is available only in the Summary pane.
- View old and new details relating to a property transaction using the Property Details feature.
- Reverse a transaction. This feature is available only in the Details pane.
- Undo a group of sequential transactions. This feature is available only in the Details pane.
- Redo a group of sequential transactions. This feature is available only in the Details pane.

## Action Log Shortcut Menu

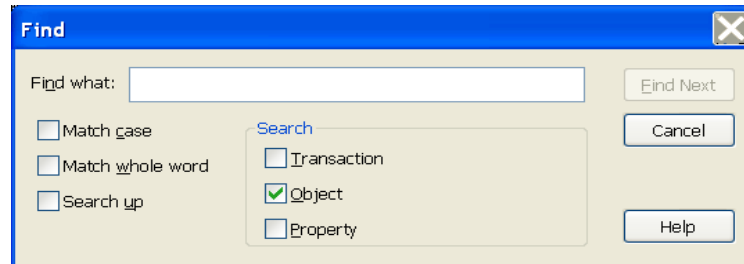
When you right-click an object in the Details pane the Action Log shortcut menu opens. This shortcut menu lists the options available based on the actions you performed prior to opening the shortcut menu. These options include:

- Undo to this point (or Redo to this point)
- Reverse
- Collapse (or Expand)
- Expand Transaction(s)
- Collapse Transaction(s)

**Note:** A shortcut menu is not available on the Summary pane.

## Locate Text Using the Find Feature

The Action Log Find dialog lets you search for specific text at the transaction level, object level, or property level. This option is available on both the Details and Summary panes.



By default, the search includes the entire tree, starting from the current selection point. If there is no current selection point, then the top of the tree is used as the starting point. If the search did not start at the top node, the search wraps to the beginning of the tree after reaching the end.

### To locate text using the Find feature

1. Click Find on the Action Log toolbar.  
The Find dialog opens.
2. Enter the text you want to search for in the Find what text box.
3. (Optional) Select the Transaction, Object, or Property check box to narrow your search.

**Note:** Since there are no transaction nodes in the Summary pane, the Transaction search option is not applicable to that pane.

4. (Optional) Select one of these check boxes to refine your search:
  - Match case check box if you want to search on case-sensitive text
  - Match whole word check box if you want to search for the entire text string

Search up check box if you want to search for the text from the bottom up
5. Click Find Next.

The next occurrence of text displays.
6. Click Cancel when you are finished searching.

The Find dialog closes.

### Action Log Metamodel Filter

The Action Log captures all changes made to a model during a modeling session. The longer the session, the larger the log becomes. You can specify object types and property types to be filtered out, which affects the way modeling events are displayed in the Action Log. These objects are not removed from the Action Log, they are only filtered from the view. The Metamodel filter is always present on the Action Log toolbar. You can display a category list of objects and properties.

The Save button saves the settings to a file called ActionLog.config in the C:\Documents and Settings\user\Application Data\CA\CA ERwin Data Modeler directory. This file can be copied to another machine to use the same filter settings.



## Select Object and Property Types Displayed in the Action Log

You can select the object types and property types you want to see displayed in the Action Log.

### To select the object and property types displayed in the Action Log

1. Click the Metamodel Filter icon on the Action Log Toolbar.

The Action Log Metamodel Filter dialog opens.

2. By default, all objects and properties are selected initially. Select Clear All to clear all of the objects and properties or clear only the objects and properties you choose to view.

The object and property types selected are displayed in the Action Log for all future transactions.

## Use Extended Find and Filter

The Extended Find and Filter feature lets you set find and filter criteria, view property changes, and use the reporting function of the Data Browser. This feature is available only on the Summary pane of the Action Log. To open the Extended Find and Filter dialog, click the Extended Find/Filter button on Action Log toolbar.

When the Extended Find and Filter dialog opens, it provides a snapshot of the Summary pane and lets you filter the information that displays so you can easily find the information you want to report on. Use the Report button on the toolbar to open the Data Browser dialog, where you can generate several different reports for the information that displays.

### To use the Extended Find and Filter option

1. Click Extended Find and Filter on the Action Log toolbar in the Summary pane.

The Extended Find and Filter dialog opens.

2. Click Find on the toolbar.

The Find Criteria dialog opens.

3. Select which Properties, Categories, and Classes you want to find. These options let you filter the information that displays.

4. Click Find to start the search.

The Find Criteria dialog closes.

5. Click the Find Next button on the Extended Find and Filter toolbar to find the next occurrence of what you are searching for.

6. Click Close.

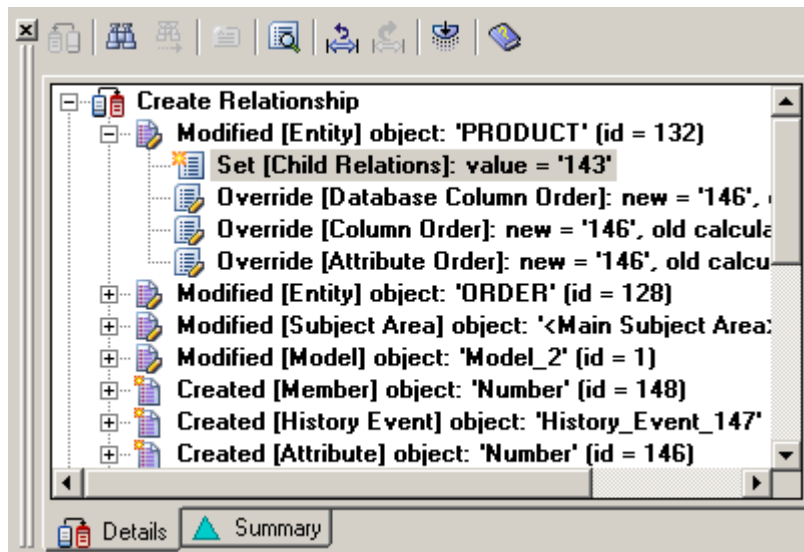
The Extended Find and Filter dialog closes.

## View Property Details

When you want to view the old and new properties for a property transaction, use the Property Details feature.

### To view property details

1. Select a property node.



**Note:** You may need to expand the transactions in the Details pane or Summary pane before you can select the property node.

2. Click the Property Details button.

The Property Change Details dialog opens, showing the original value of the property along with the current value of the property.

3. Click Close when you are finished.

The dialog closes.

### Undo a Transaction

To undo the last change that you made to your model, use the Undo button on the Toolbar or click Undo on the Edit menu. This feature undoes one change at a time, and is reflected in the Action Log by a dimmed transaction.

### Redo a Transaction

To redo a transaction that you made to your model, use the Redo button on the Toolbar or click Redo on the Edit menu. This feature restores one change at a time.

### Reverse a Transaction

The Reverse feature in the Action Log lets you perform an opposite action on most entries that appear during the current modeling session. When you reverse a transaction, the model reflects the changes made to the Action Log. This feature is only available on the Details pane, and does not sequentially reverse actions.

For example, if the Details pane displays Created [Entity] object:'Entity\_5'(id=5) and you select the transaction and click Reverse, a Delete on Entity\_5 is implied.

Depending on how complex your model is, when using the Reverse feature, an attempt is made to restore the model to its best state. Use the Activity Log to determine whether your transaction has been properly reversed.

**Important!** *Reverse applies to the entire transaction even if you select only the object or property level node.*

### To reverse a transaction

1. Click the Details tab in the Action Log.  
The Details View appears.
2. Select a node in the tree containing an action that you want to reverse, and click Reverse on the Action Log toolbar.

The opposite action occurs.

**Note:** You cannot perform a reverse action on the topmost node in the tree. Use the Undo feature instead. You also cannot reverse the transaction in which the model was created - this transaction is marked with the pin icon.

### Undo and Redo to Selected Transaction

The Undo to Selected Transaction feature in the Action Log lets you undo an entire range, or a sequential group, of transactions at the same time. Conversely, the Redo to Selected Transaction feature lets you restore a sequential group of transactions.

**Note:** To undo to a selected transaction or redo to a selected transaction, you must be in the Details pane in the Action Log.

As you create transactions on your model, each one moves the previous transaction down the tree in the Action Log, with the first transaction always appearing at the bottom of the tree. When you want to undo a range of consecutive transactions, the transactions above, including the one you select are undone. To redo a range of transactions, the transactions below, including the one you select are redone.

**Important!** After performing an undo to selected transaction, you will not be able to redo these transactions once you perform a new action, since the new action clears the redo stack.

## Undo a Group of Sequential Transactions

When using the Undo to a Selected Transaction feature, the transactions are undone in sequential order, starting with the transaction you select and ending with the latest transaction at the top of the tree.

### To undo a group of sequential transactions

**Note:** For this exercise, you need to create transactions in the model so that you can undo them.

1. Open a data model.
2. Create an entity named Customer and add the following attributes:
  - Street Address
  - City
  - State
  - ZIP Code

The transactions are recorded in the Action Log.

3. (Optional) In the Action Log, expand all the transactions by clicking the plus sign next to each one.
4. Right-click the Create Attribute transaction that is second from the bottom of the tree.

A shortcut menu opens.

5. Click Undo to this point.

**Note:** Instead of right-clicking the transaction and opening the shortcut menu, select the transaction and then click the Undo to a Selected Transaction button on the Action Log toolbar to perform the same action.

All the transactions from the one you selected up to the top of the Action Log tree are dimmed, and are removed from the model in the Diagram Window.

**Important!** Do not close your model yet. Closing your model now will end the current session of the Activity Log and you will not be able to redo the transactions you just undid.

## Redo a Group of Consecutive Transactions

When using the Redo to a Selected Transaction feature, the transactions are restored in sequential order starting with the transaction you select and moving down the tree until all dimmed transactions are restored.

### To redo a group of consecutive transactions

1. Right-click the transaction that is the starting point for the redo action in the Action Log tree, Details pane.

The shortcut menu opens.

**Note:** Instead of right-clicking the transaction and opening the shortcut menu, select the transaction and then click the Redo to a Selected Transaction button on the Action Log toolbar to perform the same action.

2. Click Redo to this point.

All the transactions that were previously undone are now restored in the Action Log as well as in the model in the Diagram Window.

3. Save your model.

## Undo/Reverse Comparison

You can undo or reverse changes you make to your model. The following table summarizes the differences between the three available features, and suggests when it is appropriate to use each one:

Feature	Toolbar	When to Use
Undo	Standard toolbar	When you want to undo the last, single action you took. This feature is similar to the Microsoft Windows undo feature; it lets you undo the last action taken.
Reverse	Action Log toolbar	When you want to perform an opposite action that is not the last action you took in the current modeling session. This feature applies to the entire transaction even if you select only the object or property level node.

Feature	Toolbar	When to Use
		<p>You can use the Undo button to undo a reverse action made in error. For some transactions, you can also reverse a reverse action.</p> <p>Note that you cannot perform a sequential reverse using this feature.</p>
Undo to selected transaction/ Undo to this point	Action Log toolbar	<p>When you want to undo sequential transactions performed in the current modeling session.</p> <p>This feature lets you undo a range, or sequential grouping, of transactions at one time.</p> <p>You can perform a redo to selected transaction to the same group of transactions or a smaller set of the consecutive transactions in the group. You can use this feature at any time during the current modeling session.</p>

### Generate an Activity Summary Log

To save the information from your Action Log, use the Activity Summary option. This option generates a report that shows an activity summary of your current modeling session. This report can be helpful since the Activity Log is cleared every time you close your model.

#### To generate an Action Summary Log

1. Click Options on the Tools menu.  
The Options dialog opens on the General tab.
2. Enter the full path in the Activity Summary section of the dialog where you want to save the report.  
(Optional) If you select the Generate on model close check box, a report is generated automatically each time before you close the model.
3. Click OK.  
The Options dialog closes.

**Note:** The generated report is saved in comma-delimited format (.csv) so that it can be viewed easily in other applications such as Microsoft Excel.

## Generate an Action Summary Report

You can filter information on the Summary pane and save the information as a report using the Data Browser. Three types of Action Summary Reports are available:

### To generate an Action Summary report

1. Click the Summary tab in the Action Log.  
The Summary pane opens.
2. Click the Extended Find and Filter button.  
The Extended Find and Filter dialog displays.
3. Click the Report button.  
The Data Browser opens.
4. Expand the Action Summary reports folder and select a report.

### Session Summary Report

Displays the summary of changes that take place in the model.

### Session Summary-Details Report

Displays a detail list of changes in a model.

### Comparison Report

Displays the differences between the original version of the model and the current version of the model.

Click the Execute button.

The report is generated.

5. (Optional) You can customize the report or print it.

**Note:** To save the report in .csv format, click Export on the File menu.



## Property Editors

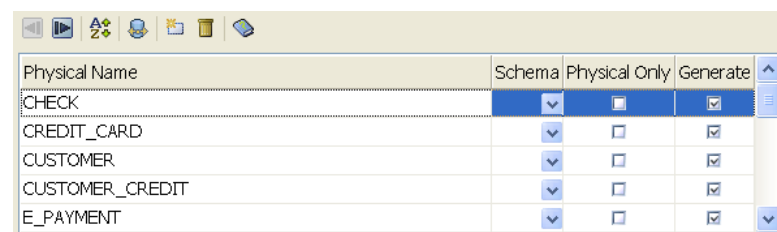
In CA ERwin Data Modeler you use the Physical Property editors to work with the relational modeling features of your selected target database. For example, when modeling in SQL Server, you can create all the objects and properties for the physical database using editors provided on the Database menu or in the Model Explorer. The editors are designed with common features that enable you to quickly create and maintain modeling objects.

Editors share these common features:

- Navigation Grid
- Navigation Toolbar
- Common Tabs and Options

### Property Editor Navigation Grid

This non-scrollable region in the upper portion of the editor lists all objects of this type in the model, and provides access to frequently used properties. Properties relevant to the object display in separate cells, each with a text entry area, check box, or drop-down control for selecting available values.



Physical Name	Schema	Physical Only	Generate
CHECK	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CREDIT_CARD	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CUSTOMER	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CUSTOMER_CREDIT	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
E_PAYMENT	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

You can adjust the amount of space allocated to the navigation Grid by moving the splitter bar up or down. Columns within the Navigation Grid may be readjusted to be narrower or wider.

## Property Editor Toolbar

You can quickly access features for each editor from the toolbar. The toolbar includes the following options:



### **Previous**

Position the editor on the previous object in the navigation grid.



### **Next**

Position the editor on the next object in the navigation grid.



### **Sort**

Sort the objects by alphabetic or reverse alphabetic order. Other sort options may be available on some types of objects.



### **DB Sync**

Open the DB Sync wizard, where you can perform a database-level compare of objects in the current model with matching objects in another model or database.



### **New**

Create a new object. It becomes the current object in the editor.



### **Delete**

Delete the selected object.

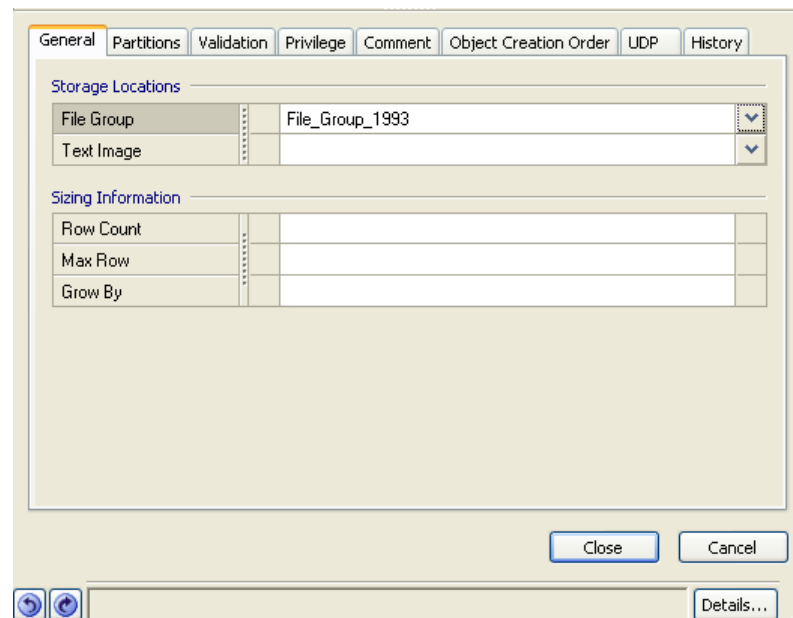


### **Help**

Access online help for the editor. Help is editor-specific and includes short definitions of all the available properties.

## Property Editor Tabs and Options

All property editors include tabs in the lower portion of the editor that include specific features relevant to the editor. Other options enable you to undo and redo actions, and display details about an action.



### General Tab

Provides the main features for the editor. When you click a displayed option, such as a drop-down list, additional features display that allow you to enter free text, or select the relevant value.

### Common Tabs

Provides additional functionality relevant to the editor. For example, many editors allow you to enter definitions or notes. Most editors allow you to create User-Defined Properties. Other tabs are displayed when a link to a related editor is relevant. For example, in databases that allow modeling of security features, a Privilege tab displays that enables you to work with privileges.

### **Undo/Redo/Details**

Provides icons you can click to undo the last action or redo the previous action within the editor. Click the Details button to open the Advisory Message Dialog that displays details about the action.

# Chapter 4: Working with Data Models

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This section contains the following topics:

[Domains](#) (see page 77)

[Relationships](#) (see page 81)

[Views](#) (see page 87)

[Display Levels](#) (see page 88)

[Subject Areas](#) (see page 93)

[Index Tables](#) (see page 96)

[Find and Replace](#) (see page 101)

[Forward Engineering](#) (see page 102)

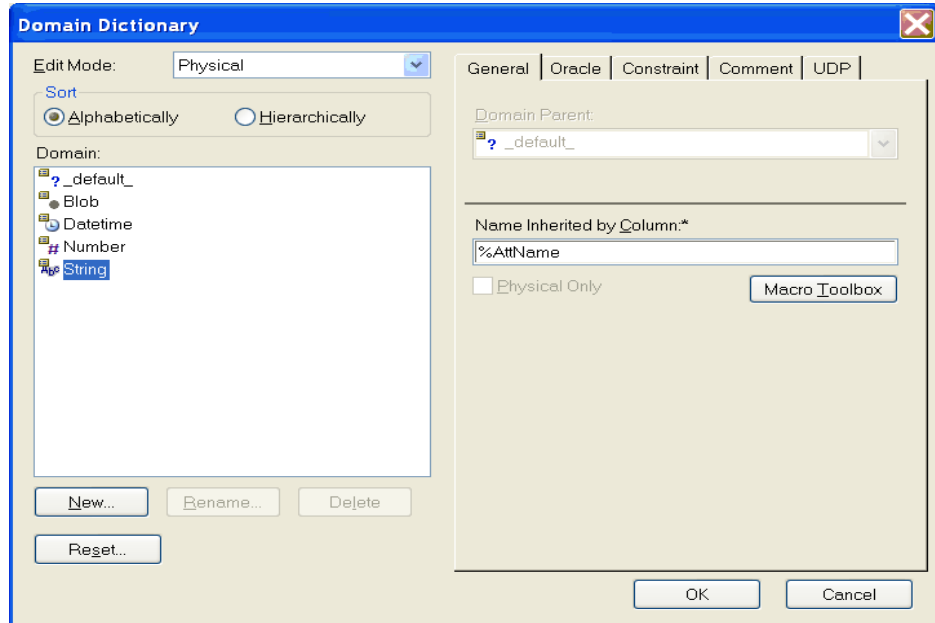
## Domains

A domain is a model object that you can use to assign properties quickly to an attribute or column. By using domains, you promote consistency because you can reuse a domain as many times as you like in a single or multiple data models.

Domains also reduce the time spent on development and maintenance. If you change the domain, all attributes or columns associated with the domain also change.

## Domain Dictionary

The Domain Dictionary lists all the domains for the data model. You can arrange them hierarchically or alphabetically. The Model Explorer has the same list as the Domain Dictionary and can also be sorted in hierarchical or alphabetic order.



You can create and modify both physical and logical domains using the Domain Dictionary. Some of the domain properties include:

- Domain name and column name
- Column datatype, default value, and valid value
- Domain comment or note and column comment or name
- User Defined Property

Note that the tabs and options in the editor change based on whether the model is logical, physical, or logical/physical.

## Inherited and Non-inherited Domain Properties

Domains have two types of properties:

- *Non-inheritable properties* do not migrate to child domains or attributes and columns associated with the domain because they are properties of the domain itself.
- *Inheritable properties* do migrate to child domains and to the attributes and columns associated with the domain.

The inheritable and non-inheritable domain name properties appear on the General tab for a Logical model.

## Attributes and Columns in Domains

When you drag-and-drop a domain from the Model Explorer onto an entity or table, you can add a new attribute to an entity or a new column to a table. The new attribute or column inherits all the inheritable properties, including its name, from the domain.

## Drag a Domain from the Model Explorer to Your Model

Use drag-and-drop to add a domain directly from the Model Explorer to an entity or table in your model.

### To drag a domain from the Model Explorer to your model

1. With the Model Explorer, Domain tab open, click the domain you want to add to your model.  
The domain is selected.
2. Drag the domain to the entity or table in your model.

The domain is added as an attribute or column.

**Note:** Depending on the Unique Naming rules that apply to the data model, you may be prompted to rename each attribute or column that you add because the domain's name is automatically assigned to each new attribute or column.

## Create a New Domain

A set of default domains are supplied that you can use as they are or you can modify their properties.

### To create a new domain

1. Click Domain Dictionary on the Model menu.

The Domain Dictionary opens.

2. Select the parent domain, which can be any existing domain.

3. Click New.

The New Domain dialog opens, and the parent domain that you selected is highlighted.

4. Enter a name for the new domain in Logical Name or Physical Name box, and click OK.

**Note:** In the New Domain dialog, the Logical Name and Physical Name boxes appear only when the model type is Logical/Physical. By default, the physical name is automatically assigned the same name as the logical domain, but you can rename the physical domain at any time.

## Domains and Datatypes

A *datatype* is a domain property and defines the physical properties of a column in a database such as length (number of characters), type (alpha or numeric), and precision (decimal). You can also define a logical datatype, which usually corresponds to a physical datatype.

By default, a new domain is assigned the same datatype as its parent domain. You can change it at any time. The available datatypes for the current model always appear in the list in the Domain Dictionary.

### To assign a datatype in the Domain Dictionary

1. In the Domain Dictionary, select the domain and click the Datatype tab in the Logical model or the Database tab in the Physical model.

The corresponding tab appears.

2. Select the new datatype for the domain from the datatype list.

3. Specify other properties for the datatype as relevant. Click OK.

Your changes are saved and the Domain Dictionary closes.



## Domain Icons


In the Model Explorer and in the Domain Dictionary, a unique icon represents each domain. A default icon is used for new domains, but you can choose a different icon to represent the domains you create.

### Assign or Change a Domain Icon

You can select any icon (.bmp file) for the non-inheritable property of the domain itself. You can assign the same icon or select a different icon to be inherited by the attributes or columns associated with the domain.

#### To assign or change a domain icon

1. In the Logical model, click Domain Dictionary on the Model menu.  
The Domain Dictionary opens. Select a domain from the Domain list.
2. In the Domain Icon drop-down list, select a new domain icon.  
The icon is assigned to the selected domain.

**Note:** Click  to open the Icons editor, where you can import a bitmap file, or rename or delete an existing icon.

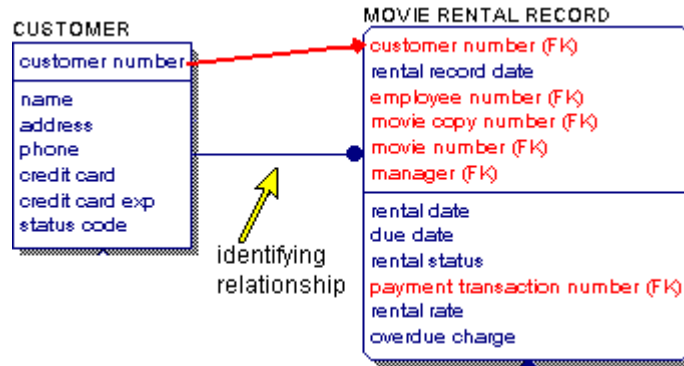
## Relationships

In a data model, a relationship shows an association between two entities or tables. A relationship is represented as a solid or dashed line that connects two entities or two tables. Depending on the notation you choose, the symbols at either end of the line may change.

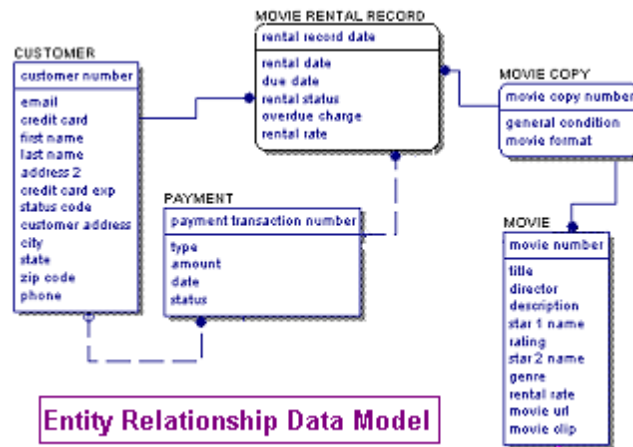
If you prefer to work in the Model Explorer, you can see the parent and child relationships for each entity and table in the Model Explorer. Double-click any of the relationship folders to open the Relationship Editor.

## Entity Relationships

The following diagram shows the relationship between the CUSTOMER entity and the MOVIE RENTAL RECORD entity using Integration DEFinition (IDEF1X) notation:

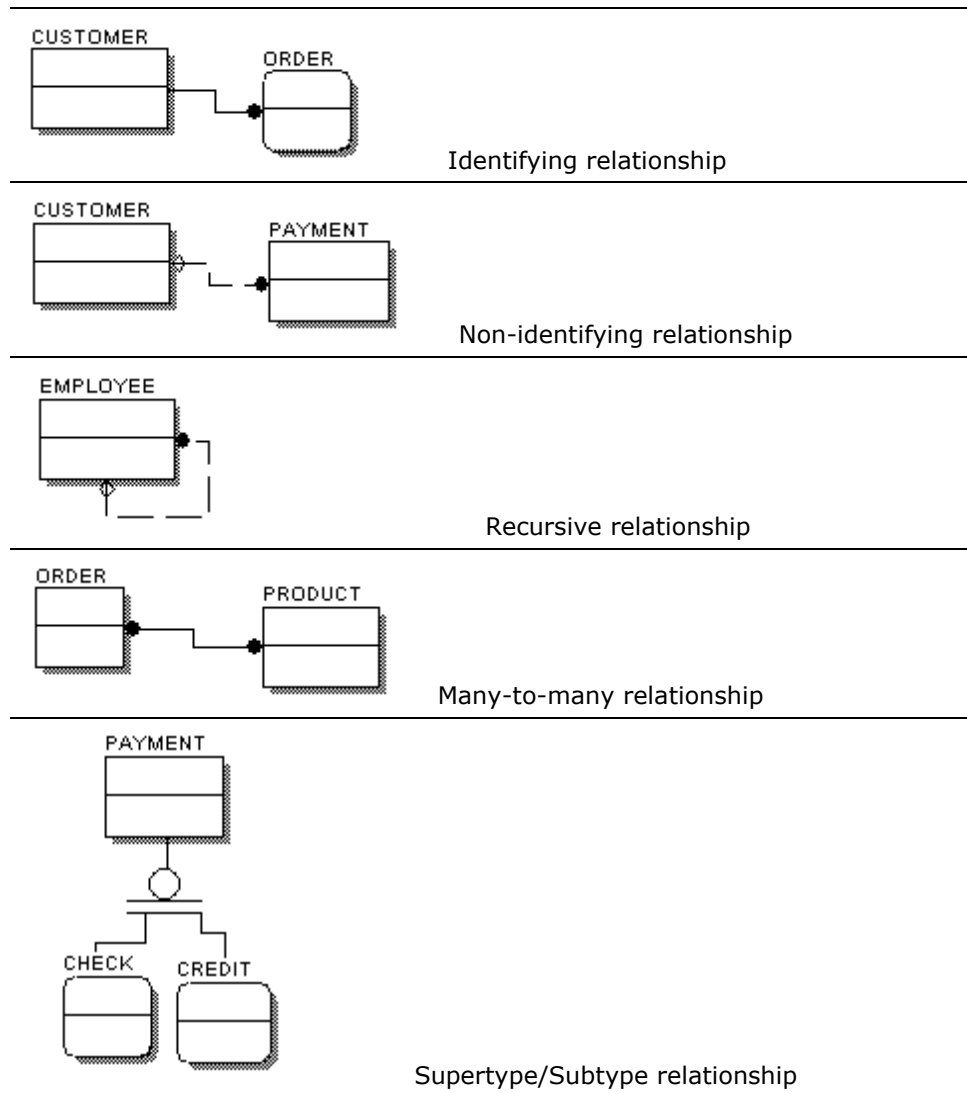


The following Entity-Relationship data model uses entities and relationships to represent the logical structures that will eventually become the physical tables in a database. A box is used with a horizontal line to depict an entity and solid or dashed connecting lines to depict a relationship between two entities.



## Other Relationship Types

In addition to identifying and non-identifying relationships, you can also create other *relationships*, as shown in the following chart:



## Relationship Creation

Many easy methods for creating a relationship are provided. The easiest way to create a relationship is to use the Relationship tool in the Toolbox. Depending on the model type (logical or physical) and the diagram notation, the relationship tools in the toolbar vary.

Before you create a relationship, consider whether you want the foreign keys to migrate to the primary key area or the non-key area of the entity or table.

## Relationship Lines

After you create a relationship line or rearrange existing lines, the line position is saved so that routine modeling tasks, such as switching between logical and physical models with the same display level, do not result in a rearrangement of any of the relationship lines.

When you click a relationship line, the line is highlighted with a shadow. This lets you see the selected line more clearly.

You can format relationship lines in your model by clicking Preferences on the Format menu and clicking the Layout tab. You can choose to perform the following actions:

- Clear the Allow manual layout check box to prohibit manual layout of relationship lines. Click this check box to allow manual reshaping of relationship lines.
- Click the Redraw All Relationship Lines button to shape all relationship lines automatically.
- You can also choose to automatically layout the currently selected relationship line by right-clicking the line and selecting Relationship Auto Layout from the shortcut menu.

## Relationship Editor

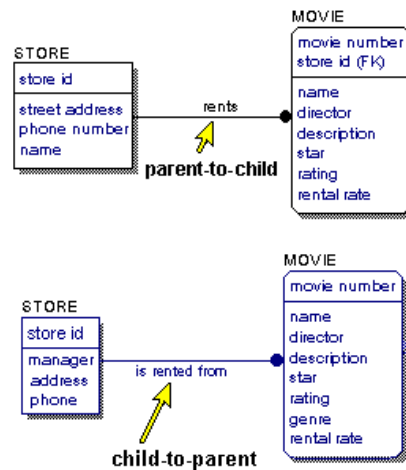
After you create a relationship, you can double-click the relationship line to open the Relationship Editor. You can edit many of the relationship's properties including:

- Parent and child verb phrases
- Relationship definition
- Rolename
- Referential Integrity
- Cardinality

## Verb Phrases

A verb phrase describes how two entities are related. You can create two types of verb phrases:

- **Parent-to-child** verb phrase describes how the parent is related to the child. In the first example below, the verb phrase states that “A STORE rents A MOVIE.”
- **Child-to-parent** verb phrase describes how a child entity is related to a parent entity. In the second example below, the verb phrase states that “A MOVIE is rented from A STORE.”



**Note:** You can enter parent and child verb phrases directly in the Diagram Window using on-diagram editing.

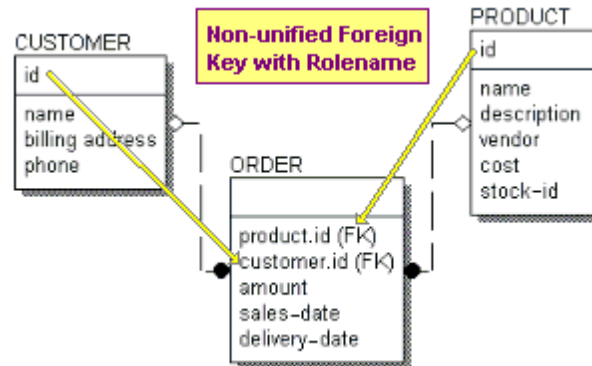
## Foreign Key Migration and Unification

When you create a relationship between entities, the primary key attributes of the parent entity are automatically migrated to the child entity. The designator (FK) indicates the name of the migrated key attribute, also known as a *foreign key*. This migration occurs automatically in the physical model.

If the foreign key attribute has the same name as an owned attribute in the child entity, the two instances are automatically unified into one attribute because it assumes that they are the same attribute. The process of combining or unifying identical attributes in an entity is called *unification*.

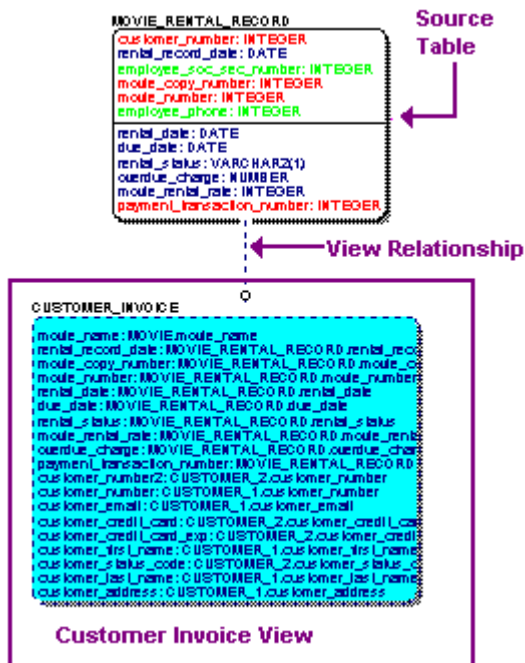
## Rolenames

Sometimes, unification is not the desired behavior. You may want to maintain a distinction between multiple attributes with the same name in an entity because each serves a different purpose. In this situation, you can assign a *rolename*, which is similar to an alias that you assign to a foreign key.



## Views

In a physical model, you can create a *view*, which is really a SQL query that is permanently stored in the database under assigned names. Typically, a view is used to present specific database information for a target audience. In the following example, the accounting department of a video store chain presumably uses the CUSTOMER INVOICE view to generate a billing invoice.



A view is really a virtual table; a view table (box) and relationship line are both drawn with dashed-lines.

In the physical model, you can use view tools in the toolbox to draw the view table and connect the view relationship to a source table. Behind the scenes, the SQL query is written for the view, which you can view and edit in the Views Editor.

You can use views in SQL to perform the following tasks:

- Create a customized presentation of the data stored in the database.
- Restrict access to data, allowing different users access to only certain rows or columns of a table.
- Simplify database access by creating customized structures tailored to the needs of individual users. A user can write a simple query on a view rather than a complex query on the actual database tables.

**Note:** For more information on Views, see the online help.

## Methods for Adding a View to a Model

You can add a view using any of the following methods:

- Click the Entity button on the Toolbox. Then click in the Diagram Window.
- Reverse engineer an existing database.
- Copy a view from one model and paste it into another model.
- Right-click the Views folder in the Model Explorer and choose New.

**Note:** For more information about adding a View to a model see the online help.

## Display Levels

Two sets of display levels are provided, one for the logical model and one for the physical model.

These display levels are useful for showing different types of information in a data model, particularly when different people and groups use the data model for their specific job in the development process.

### Logical Display Levels

The Logical Display levels are as follows:

#### **Entity**

Displays the name of each entity in a data model inside an entity box. No other information displays for the entity.

#### **Attribute**

Displays the attributes for each entity in a data model, with the primary key attributes above the line and the non-key attributes below the line in an entity box.



### Primary Key

Displays the primary key attributes (those found above the line in an entity box) for each entity in a data model. The attributes below the line are hidden, but display when you switch back to the Attribute Display Level and you can also see them in the Attribute Editor.

### Definition

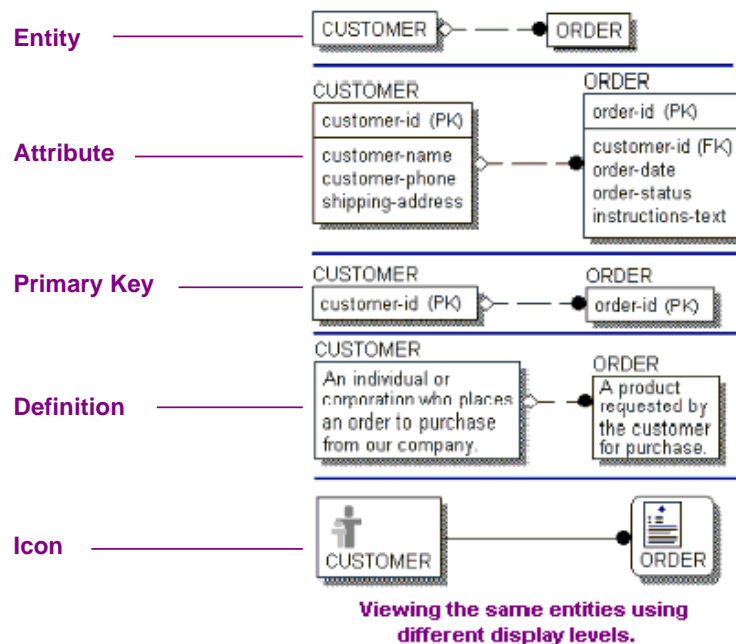
Displays the definition for each entity in a data model.

### Icon

Displays the bitmap, if you have assigned one to the entity. You can assign a different bitmap to each entity in the Icon tab of the Entity Editor.

**Note:** For more information about assigning bitmaps to entities, see the Online Help.

The following diagram uses the same entities and illustrates each of the logical display levels:



## Physical Display Levels

The Physical Display levels are as follows:

### Table

Displays the name of each table in a data model inside a box. No other information displays for the table.

### Column

Displays the columns for each table in a data model, with the primary key columns above the line and the non-key columns below the line in a box.

### Primary Key

Displays the primary key attributes (those found above the line in an entity box) for each entity in a data model. The attributes below the line are hidden, but display when you switch back to the Attribute Display Level and you can also see them in the Attribute Editor.

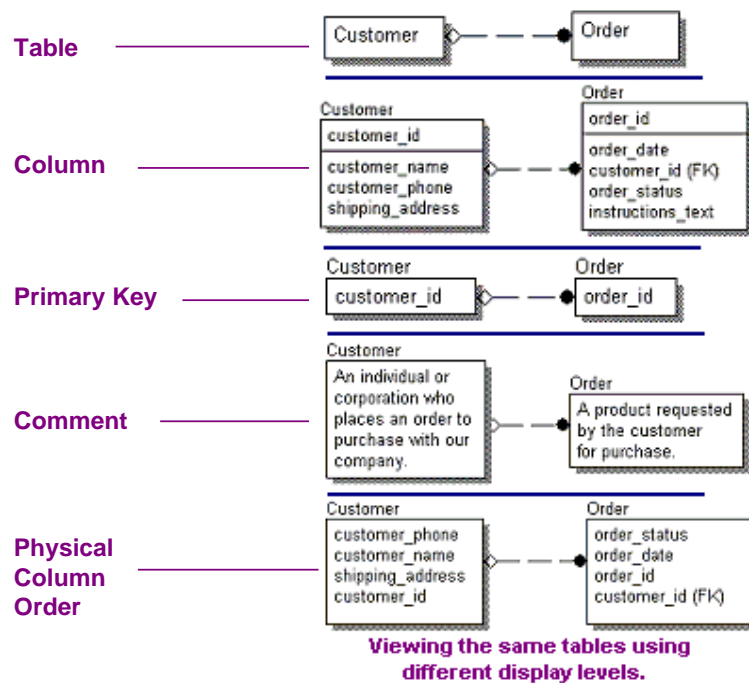
### Comment

Displays the definition for each table in a data model.

### Physical column order

Displays the order in which each column appears in the corresponding table.

The following diagram uses the same entities and illustrates each of the physical display levels:



## Display Options

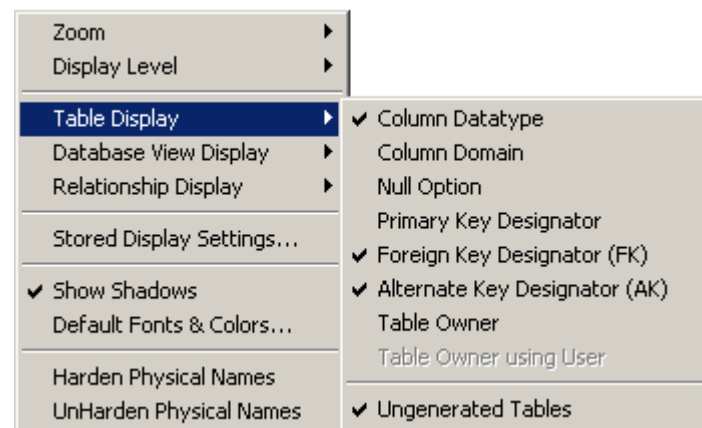
You are also provided with display options for entities and their relationships. These options are useful for showing different types of information in the logical model:

- Entity display options
- Relationship display options

Use the shortcut menu to set these options.

### Entity or Table Display Options

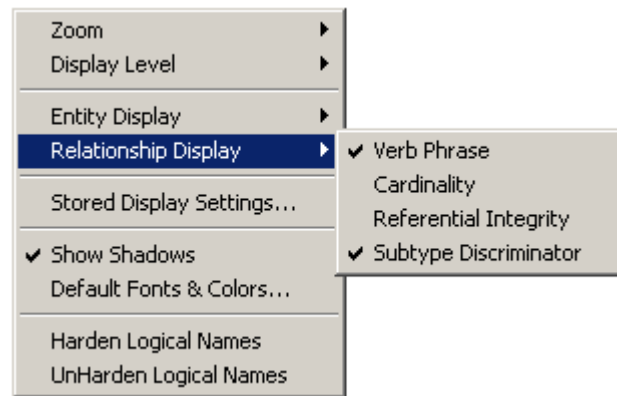
You can use the entity or table display options to view information about entities and tables in a data model.



**Note:** The Format menu changes based on whether the currently displayed model is physical or logical.

## Relationship Display Option

In both the logical and physical data model, you can use the display options to view the relationship properties.



## Create a Stored Display

If you want to quickly change the graphic presentation of your data model without resetting the display options each time, you can create a stored display for each set of display options.

### To create a stored display

1. Click Stored Display Settings on the Format menu.  
The Stored Displays dialog opens.
2. Click New.  
The New Stored Display dialog opens.
3. Enter a name for the stored display, and click OK.  
The New Stored Display dialog closes.
4. Select the display option settings by clicking the property tabs (that is, General, Logical, Physical, Definition, or UDP) in the Stored Displays dialog.
5. Click OK to save the new stored display.  
The new stored display is saved and the dialog closes.

## Stored Display Tabs

For each stored display you create, a tab is added to the bottom of the Diagram Window. When you save a data model, all stored displays that are associated with the data model are saved.

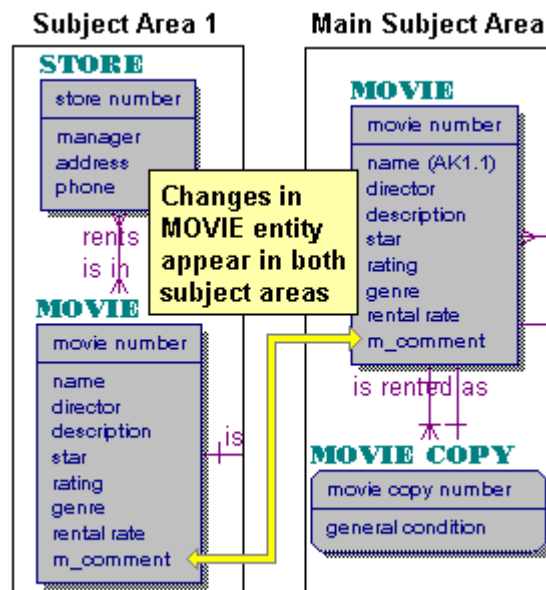
To see the Stored Display tabs, click the Stored Display Tabs option on the View menu.

## Subject Areas

A subject area is a subset of objects taken from the whole pool of objects in your diagram. By default, a new data model includes one subject area called the Main Subject Area, which includes all of the objects in the data model. However, you can create others.

It is important to understand that the subject areas are not copies of the data model, but are dynamic subsets of the data model. In other words, if you add members to a subject area those objects are added to the current subject area and the Main Subject Area.

If you add an attribute or column to an existing entity or table, the new object is added to every subject area in which the entity or table is a member.



### Subject Area Members

An object that is included in a subject area is referred to as a *member* of a subject area.

By default every object in the data model is a member of the Main Subject Area. A member can also belong to one or more other subject areas in the same data model.

### Subject Areas in the Logical/Physical Model

For every subject area in a Logical/Physical model, a corresponding subject area is automatically created for the other model type. So, if you create a Customer Subject Area in logical model, a Customer Area is created in the physical model.

### The Subject Area Editor

In the Subject Area Editor you can perform these tasks:

- Create a subject area
- Add members to a subject area
- Modify the properties of a subject area
- Delete a subject area

### Create a New Subject Area in the Subject Area Editor

#### **To create a new subject area in the Subject Area editor**

1. Click Subject Areas on the Model menu or click the Subject Areas button on the toolbar.

The Subject Area Editor opens.

2. Click New.

The New Subject Area dialog opens.

3. Enter a name for the new subject area, and click OK.

The New Subject Area dialog closes.

4. Click the Members tab and use the arrows to include the objects in the new subject area (on the right).

5. Click OK.

The Subject Area Editor closes, and the new subject area appears in the Diagram Window.

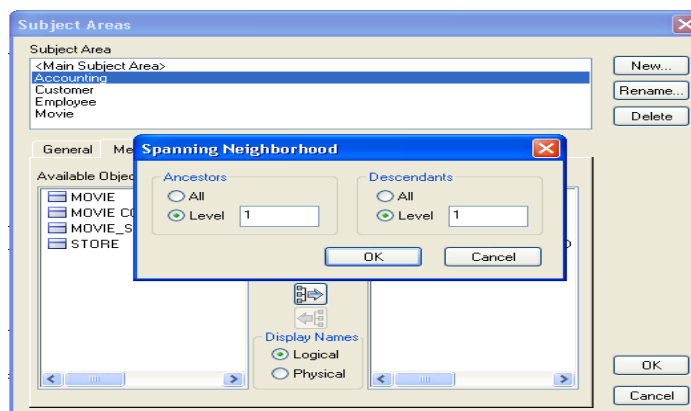
## Spanning Neighborhoods

A quick way to add members to a subject area is to click the Span Neighborhood



icon while using the Subject Area Editor. This opens the Spanning Neighborhood dialog.

In the Spanning Neighborhood dialog, you can specify the level of ancestors and descendants you want to automatically include in the subject area. Ancestors are the parents and grandparents of an entity. Descendants are the children and grandchildren of an entity.



## Subject Areas in the Model Explorer

The Model Explorer provides a quick view of the subject areas in the data model. You can view them in the following ways:

- In the Model pane, you can see the Subject Areas along with all of the other data model objects.
- In the Subject Areas pane, you can view all of the subject areas at a glance.

## Create Subject Areas in the Model Explorer

### To create a subject area in the Model Explorer

1. In the Model Explorer Model pane, right-click the Subject Areas folder.  
A shortcut menu opens.
2. Select New.  
A New Subject Area text box is added to the bottom of the Subject Areas list.

3. Enter a name for the new subject area in the text box.
4. Expand the Main Subject Areas folder and decide which members you want to include in the new subject area.
5. Drag those members from the Main Subject Area folder into the new subject area folder.

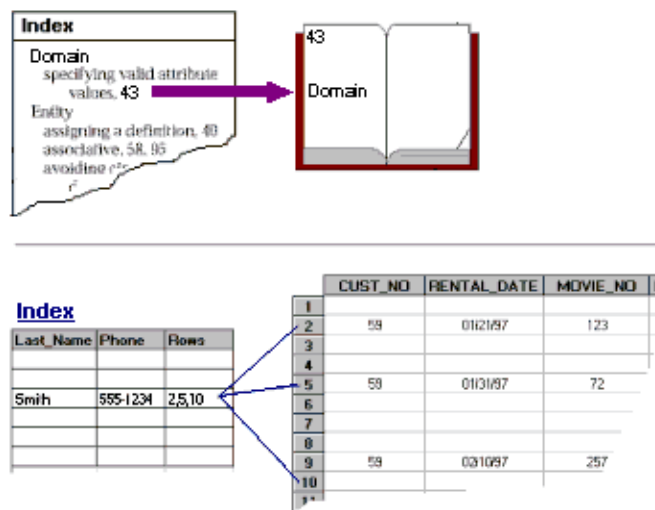
The members now appear in both subject area folders.

**Note:** All of the objects in all of the subject areas are kept track of and the data model is kept in sync with the contents of the Model Explorer.

## Index Tables

Just as an index in a book helps you quickly find information by listing all the pages where a particular topic is discussed, an index in a database table points to all the rows where a particular column value is stored.

An index table helps to quickly locate a record in a database by pointing to a specific column and row in a table. So, for example, to locate a customer in the database, an index on the CUSTOMER table references the Customer Number (account number).



You can use indexes in two ways:

- To sequentially access the indexed file.
- To directly access individual records in the indexed file based on a given value for the indexed field.



## Types of Indexes

The following types of indexes are supported:

### **Primary Key (PK) Index**

A primary key index is an index for the primary key columns in a particular table.

You can have only one primary key index for each table, although each index can include multiple columns.

A primary key index is unique, so the indexed columns cannot have duplicate values nor can they be null (empty). For example, a customer phone number must be unique in order to locate a particular customer record.

A primary key index for each table that has one or more primary key columns is automatically created.

### **Foreign Key (FK) Index**

A foreign key index is an index for one or more foreign key columns in a particular table. A foreign key index is automatically created for each set of foreign key columns that migrate through a relationship.

### **Alternate Key (AK) Index**

A unique index that provides an alternative unique index in addition to the primary key index. For example, to locate a customer quickly, the primary key index may include only the customer account number. As an alternative, the alternate key index may include the customer phone number column, which must be a unique number associated with a customer record.

### **Inversion Entry (IE) Index**

A non-unique, or inversion entry index lets you quickly access records using values that are not unique, such as EMPLOYEE last name. Duplicate values in the inversion entry index are allowed.

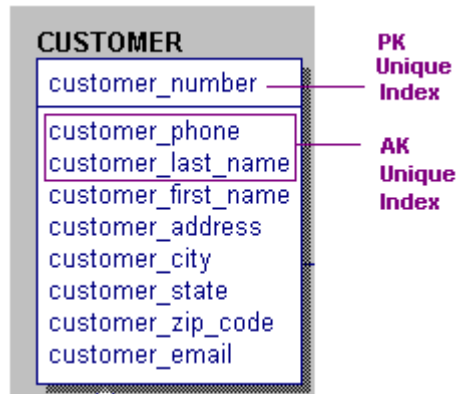
In a Logical/Physical model, if you create an index in the physical model, the corresponding *key group* in the logical model is automatically created. A key group is a logical modeling tool that identifies relationships between entities that are implemented as foreign keys. You can also use key groups to identify potential primary keys or alternate keys for use in the physical model.

## Unique and Non-Unique Indexes

Imagine a database for a video rental chain. It probably has hundreds of thousands of customer records. However, when it is time to check out a video, it is important for each customer record to be quickly located for better customer service.

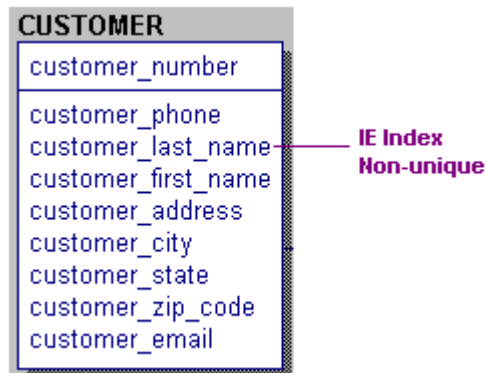
If the video store clerk knows the customer account number, the customer's record is found quickly because the Primary Key index references a unique customer number.

Often the customer account number is not available. But, a customer record is found quickly if the video store database has another *unique index* that points to the Customer Last Name and Customer Phone columns.



Alternatively, the video store may also want to look up a customer record by last name, even though the search may produce multiple records.

In this case, a *non-unique index* may be created on the CUSTOMER table that points to the Customer Last Name column alone.



## The Index Editor

In the physical model, you can use the Index Editor to perform the following tasks:

- Create, rename, or delete an index
- View the indexes for a table
- View the properties of an index
- Use the Members tab to view all the available columns in the table and those columns already assigned to the index

Depending on the target database, other index properties may be available.

**Note:** By default, the Primary Key index is automatically created. It is unique and includes all primary key columns.

## Create an Index in the Index Editor

Only one Primary Key index can apply to a table, although you can create multiple AK (unique) or IE (non-unique) indexes.

### To create an index in the Index Editor

1. Right-click a table in the diagram and click Indexes.

The Index Editor opens.

2. Click New.

The New Index dialog opens. A default index name is assigned, which you can accept or change.

3. Select the Unique option to create an AK index or clear the Unique option to create an IE index.

4. Click OK.

The New Index dialog closes.

5. In the Index Editor, select the index columns from the Available Columns list and use the Arrow button to move them to the Index Members list.

6. Click OK.

The index is saved and the dialog closes.

## Create an Index in the Model Explorer

You can use the Model Explorer to create indexes.

### To create an index in the Model Explorer

1. In the Model tab of the Model Explorer, click Tables to expand the folder.
2. Right-click the Indexes folder.

A shortcut menu opens.

3. Select either New Unique Index or New Non-Unique Index.

A new folder with a default name is added to the Indexes list.

4. Right-click the new Index folder.

A shortcut menu opens.

5. Click Properties.

The Index Editor opens.

6. Select the index columns from the Available Columns list and use the Arrow button to move them to the Index Members list.

7. Click Close.

Your changes are saved and the dialog closes.

## Find and Replace

You can use the Find and Replace feature to globally search for anything that is exposed in the model (including all string properties) and optionally replace with the text specified. You can use features such as matching case, wild cards, and search direction. This gives modelers the ability to make changes across large models to ensure consistent metadata.

**Note:** The Find and Replace feature does not replace Find functionality already implemented elsewhere in the program (i.e. Model Explorer, Action Log, Data Browser, Complete Compare).

### To use the Find and Replace option

1. Click Find on the Edit menu.

The Find and Replace dialog opens.

2. Enter the text you want to find and select from the following options:

#### Match Case

Searches text based on case. When cleared, the case is ignored to determine match.

#### Match whole word

Searches for the entire text string to determine match.

#### Match against expanded values

When selected, macros are expanded first then the match is determined on the expanded value. Table and view names are macros by default, unless they are specifically overridden.

#### Wildcard

Selects DOS or SQL wildcards to determine match. For example, use the asterisk (\*) wildcard to search for a string of characters ("c\*r" finds "customer" and "car").

#### Search direction

Selects which direction within the model to search the text-- forward or backward. The default is Forward.

Select the Replace check box if you want to replace the text found, and click Find to start the search.

If the text is found, it appears below in the Found object and property pane. You can click Replace to replace the text found with the new text in the Replace field.

**Note:** You can also directly edit the text in the Found object and property pane if the property is not marked as Read-only. If you edit the text in the property pane and click Replace, then the text in the property pane is used as the replacement text and not the text in the Replace with field.

If the search text is not located, a message states that no matches were found.

- Click Find Next to repeat the last search you specified and find the next occurrence of the text.

The next occurrence is selected. The search terminates when it reaches the end of the model. You will be prompted that there are no more matches and if you like to restart the search from the beginning of the model.

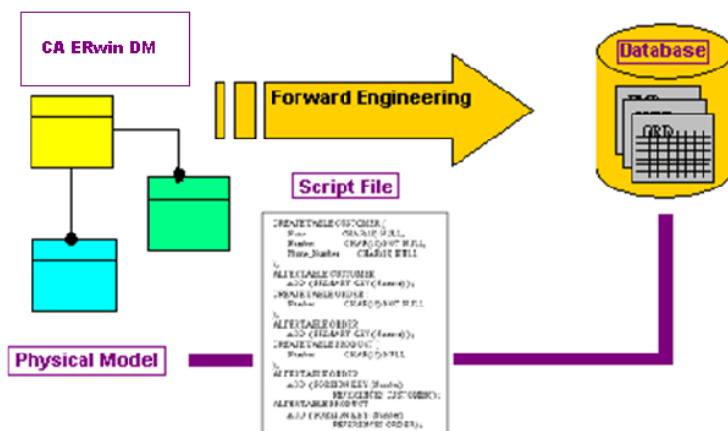
## Forward Engineering

Forward engineering is a process that generates the physical database schema from the data model. Use the Forward Engineering feature to design and create your database *without* writing a single SQL CREATE TABLE or CREATE INDEX statement.

When you generate a schema, you can choose to generate:

- Tables
- Triggers
- Stored procedures
- Indexes
- Constraints
- Physical storage objects
- Other database features supported by your target DBMS

Using forward engineering, you can choose to generate a script file, which you can use to update the database using a database administration tool, or you can directly connect to the database catalog. Either way, most of the work is done for you by generating the script for your target server.



Before you forward engineer, you can view the *schema*, which is a text-based representation of the database objects that will be created in the database from the script. The data definition language (DDL) specific to the target database is used to write the script. Each time you add an object or property to your data model, the script file is automatically updated to reflect the change to the data model.

## Preview Schema Generation

### To preview schema generation

1. Click Open on the File menu, and choose a logical/physical model you previously saved.

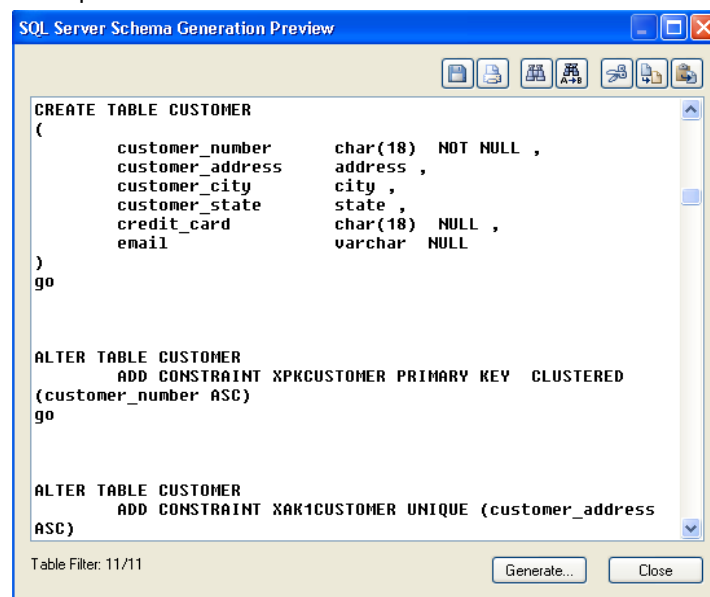
Your model opens in the main workplace.

2. Use the Model Type Indicator to switch the Physical model.
3. Click Forward Engineer Schema Generation on the Tools menu.

The Schema Generation dialog opens.

4. Click Preview.

The Schema Generation Preview dialog opens, similar to the following example:



The Preview Schema screen is similar to a text editor.

5. Edit the schema by typing directly in the editor or use the toolbar at the top of the editor to perform other common text processing functions.
6. Click Save to save your changes, or click Generate to generate the schema. Click close to close the Preview window.

When you close the Preview window, you return to the main Forward Engineer dialog.

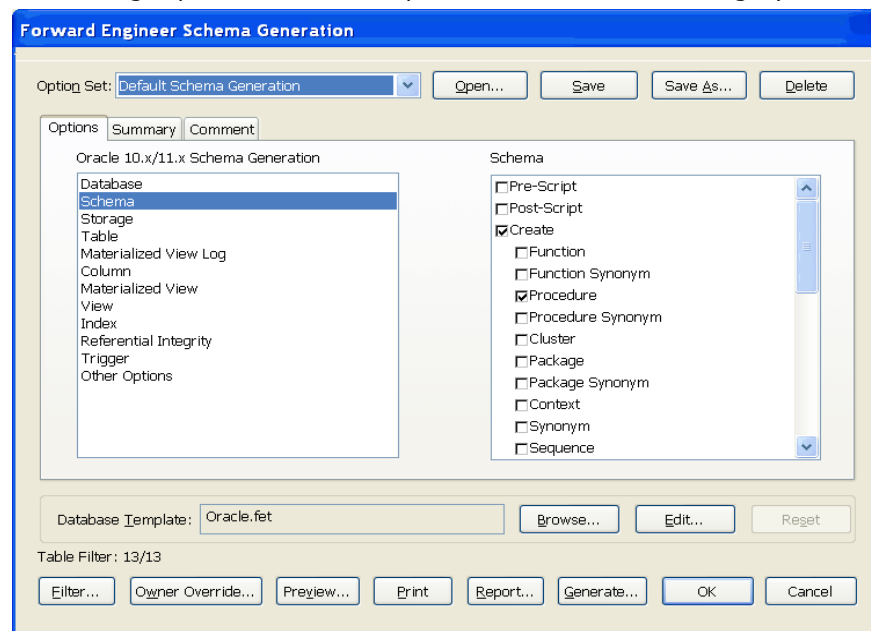
## Change Schema Generation Options

You can view and set schema generation options by category. The target server you select determines the options that appear in the editor.

### To change the schema generation options

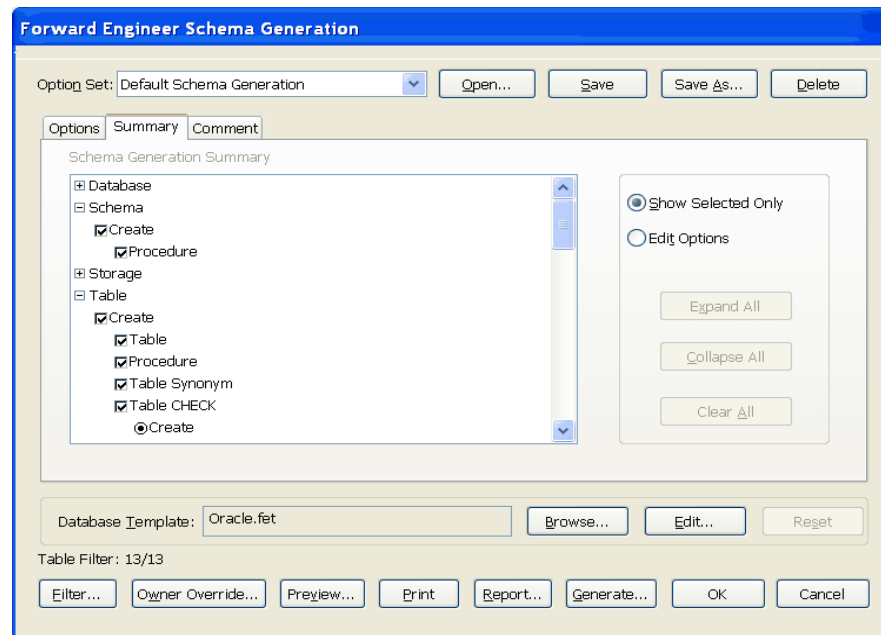
1. Select Forward Engineer, Schema Generator from the Tools menu.

The Schema Generation Editor opens. The left panel lists all the categories and the right panel lists all the options for the selected category.





2. Make your selections in the right panel of the Options tab, or click the Summary tab to view the default options.



3. Click OK when you are finished.  
The Schema Generation Editor closes.

### Additional Schema Generation Options

A full range of options is available for generating a schema. Use these additional options for refining your output:

#### Check Model

Creates a Model Validation report before you forward engineer your model. The report checks for corrupt objects and reports other errors associated with correct forward engineering. To run the report click Forward Engineer, Check Model on the Tools menu.

#### Using Option Sets

Lets you save the selections you make in the Options tab to an external XML file, or you can save the selections with the model. Click Save As to save your current option set. You can also share option sets with other users. If you want to use an option set you created earlier, click Open to select the XML file.

### Filtering Tables

Lets you filter out selected tables for the schema generation when you click the Filter button. By default, all tables in your model are included in the schema generation. A selection dialog opens that lets you move selected tables out of the list of tables included in the schema generation.

### Setting an Owner Override

Lets you set a global name override, or a name override for other physical objects relevant to your target server, such as tables, views, and triggers.

## Generate the Schema

You can preview your schema as many times as you want. When you are satisfied with the content of the schema, you can generate it to your target server.

### To generate the schema

1. Start the schema generation process using one of these methods:

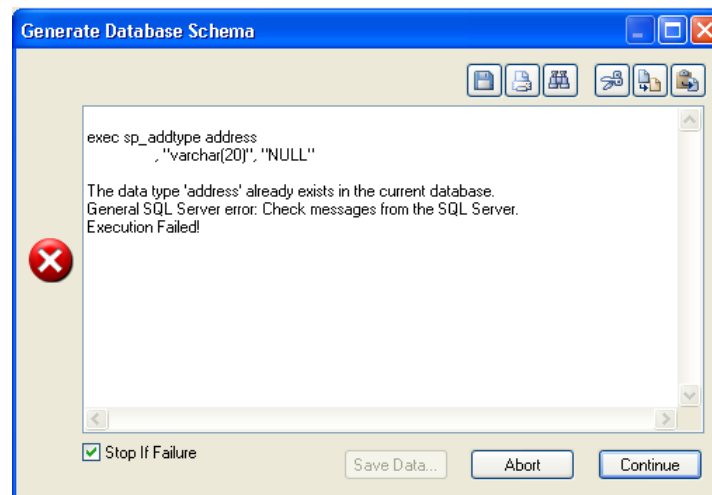
- From the Preview dialog, click Generate.
- From the main Schema Generation dialog, click Generate.

The <database> Connection dialog opens.

2. Enter the required connection criteria. Click Connect.

The schema generation process begins.

As the schema is generated, you receive status information. When you select the Stop If Failure check box in the dialog, you can choose to Continue or Abort the generation.



**Note:** To fix an error found during generation, click Abort and then return to the Schema Preview dialog, where you can find and correct the source of the error.

## Save the Script File

You can save or print your script file. You may want to save the script as a report that contains all the queries, and success or failure messages for your schema.

### To save the script file

1. Click Report at the bottom of the <database> Schema Generation dialog.  
The Save As dialog opens.
2. Enter a file name in the File Name box, and click Save.  
The Save As dialog closes.
3. Click OK.  
The <database> Schema Generation dialog closes.

## Generate Alter Scripts

The Schema Generation functionality includes the capability to quickly generate alter scripts. When you make changes to your model you can synchronize them with your database or script file. Use the Schema Generation/Alter Script tool to do this.

### To generate the alter script to your database

1. Open a physical model and alter it in some way, for example, by adding a new table with some columns.
2. Click Alter Script/Schema Generation on the Tools menu.  
The Alter Script Schema Generation dialog opens.

3. Click Preview to review the changes to your schema, and then click Generate.

**Note:** If you are not connected to your target server, you are prompted to make the connection before the schema generation starts.

4. Click Close on the File menu when you are finished working with the Alter Script option.

The Close dialog opens.

5. Select the Save As .erwin file option and click OK.

Your model is saved and closed .

**Note:** Alter Script functionality is also included in the Complete Compare Wizard. As you work in the Resolve Differences dialog of the wizard, you can generate an alter script when you click the appropriate icon on the toolbar. For more information about Complete Compare, see the "Working with Data Design Features" chapter of this guide.

## Chapter 5: Working with Data Design Features

This section contains the following topics:

Reverse Engineering (see page 109)

[How to Use the Metadata Integration Wizard](#) (see page 115)

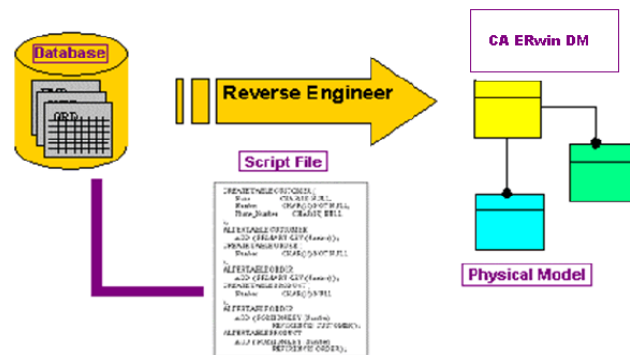
[Complete Compare](#) (see page 120)

## Reverse Engineering

You can create a data model by *reverse engineering*, which is a process that takes advantage of an existing database to speed the design of a new data model and the subsequent delivery of new systems. The process of reverse engineering saves considerable time because the work of creating a new data model directly from the database is done for you.

When you have an existing database from which you want to create a data model, you can reverse engineer the database schema, which is converted into a graphical representation of the database structures in a new model.

The following diagram illustrates the reverse engineering process:



Information in your database *or* script file is captured, including:

- Tables
- Columns
- Relationships
- Triggers
- Stored procedures
- Validation rules
- Physical storage properties

## Database Connection Overview

CA ERwin Data Modeler provides a gateway to your physical database using the Database Connection dialog. You use this dialog to enter connection criteria. Once the connection is established, you work directly with the physical catalog as you use CA ERwin Data Modeler modeling tools.

Review the basic requirements for establishing database connection before you attempt to connect to a database.

- Verify that the database you plan to work with is supported by CA ERwin Data Modeler. The current list of supported databases and versions appears in the CA ERwin Data Modeler Release Notes, and in the ERwin Data Modeler - Target Server dialog.
- Select the database and version in the ERwin Data Modeler - Target Server dialog. Click Choose Database on the Database menu in the physical model view to open this dialog. The database that you select in this dialog is used to display connection parameters on the <Database> Connection dialog.
- Install the appropriate client database software on the machine you want to connect from (and which is running CA ERwin Data Modeler). You must use a direct physical connection to the database, not a gateway or proxy connection.
- If your target server is SQL Server, Oracle, or Teradata, you can use Windows Authentication to connect. Before you use this connection option, check with your Database Administrator to be sure Windows Authentication is set up for your Windows account.
- Verify your User Name and Password information if you plan to use the database connection option.
- Know other details about database parameters/values needed to connect, for example, the server and database name, the connection string, the alternate catalog, and so on as is appropriate for your target server.

## Template Selection

Whether you reverse engineer from a script or directly from a database, you can select a Physical or a Logical/Physical template. When you select a template, consider the design layer hierarchy and where the data model that you create by reverse engineering fits in the hierarchy. For example, you may want to begin with a physical model and then derive other models from that source. Or, you may want to reverse engineer a logical/physical model and split that model into separate logical and physical models. You can then use either model as a source for other models in the design layer hierarchy.

## Options for Reverse Engineering

Additional steps in reverse engineering involve:

- Choosing the database objects and properties that you want to import
- Selecting physical database options
- Specifying whether you want to infer primary keys or relationships from indexes
- Setting case conversion options

The options and the object list vary depending on the database or SQL file that you intend to reverse engineer.

## Set Model Type, Template, and Database For Reverse Engineer

The first step to reverse engineer a database or script file is to indicate the model type, template and database. These choices affect the options that are displayed on the Set Options dialog.

To set model type, template, and database for reverse engineer

1. Click Reverse Engineer on the Tools menu.

The Select Template dialog opens.

2. Complete the following fields:

### **New Model Type**

Specifies the model type for your new model. You can choose physical-only, or logical/physical.

### **Create Using Template**

Specifies the template for your new model. This field has the following options:

#### **Remove**

Removes a selected template from the list. You cannot delete the default template file.

#### **Browse File System**

Browses your file system to select the template that you want to use for the new model.

#### **Browse CA ERwin MM**

Displays the CA ERwin Model Manager Open dialog where you can select the template that you want to use for the new model. This option is only available when you are connected to CA ERwin Model Manager.

### **Target Database**

Specifies the target SQL or Desktop DBMS and version for the new model.

3. Click Next.

The Set Options dialog opens, where you select options for reverse engineering specific objects and properties.



## Set Options for Reverse Engineer

After you select the model type, template, and database, you set options to reverse engineer specific objects.

### To set options for reverse engineer

1. Click Reverse Engineer on the Tools menu.  
The Select Template dialog opens.
2. Select the new model type, template, and target database, then click Next.  
The Set Options dialog opens.
3. Complete the following fields:

#### Reverse Engineer From

Select to reverse engineer from a database or script file. If you choose script file, click Browse to select the file.

#### Items to Reverse Engineer

Displays the default option set, which includes all the objects and properties for the selected target server. You can create and save a new option set based on your requirements. Select or clear an object or property from the object tree to include or exclude it from the reverse engineer.

### Reverse Engineer System Objects

Select to reverse engineer system and user tables, or only user tables. This field is only available when you reverse engineer from a database.

#### Table/Views In Owner:

Select to reverse engineer tables and views by ownership. This field is only available when you reverse engineer from a database. This field has the following options:

#### **All**

Reverse engineer all tables and views in the database, regardless of the owner.

#### **Current**

Reverse engineer only those tables or views owned by the current user as entered in the <Database> Connection dialog.

#### **Owners (comma separated)**

Filter the tables or views that are reverse engineered to the tables or views owned by the owner name or names (separated by commas) specified in this box.

#### **In**

Opens the Filter By Table Container dialog to select one or more TABLESPACES or databases that you want to reverse engineer.

#### Infer

Indicate if you want to infer primary keys and relationships during reverse engineer. This field includes the following options:

##### **Primary Keys**

Infer primary key columns for tables based on defined indexes.

##### **Relations**

Infer relationships between tables based on either primary key column names or defined indexes, based on the Indexes and Names options.

##### **Indexes**

Infer relationships from the table indexes. When you click this button, the relationship between two tables is inferred only if the primary key columns of the parent table are in an index in the child table.

##### **Names**

Infer relationships from the primary key column names. When you click this button, a relationship is inferred between two tables if all of the primary key columns of the parent are in the child table.

**Note:** If the target database or DDL script file supports primary key and foreign key declarations, you do not need to use the Primary Keys, Relations, Indexes, or Names options.

#### Case Conversion of Physical Names

Select a choice for case conversion of physical names. You can convert names to lower or upper case, or select 'None' to preserve the case exactly as it appears in the script file or database.

#### Case Conversion of Logical Names

Select a choice for case conversion of logical names. You can convert names to lower or upper case, or select 'None' to preserve the case exactly as it appears in the script file or database. Select 'Mixed' to preserve mixed-case logical names.

#### **Include Generated Triggers**

Specify whether or not ERwin-generated triggers are loaded during the reverse engineer process. This option is linked to the "Automatically Create RI Triggers " setting in the Model Properties dialog, RI Default tabs. When you choose to Automatically create RI triggers, the triggers are treated as model objects and can be forward-engineered into a model, database, or script file. You can include or exclude these triggers when you reverse engineer.

4. Click Next.

The database or script is processed and appears as a new model in the main workspace.

**Note:** When you reverse engineer from a database, you are prompted to connect to the database. If processing errors occur, a dialog displays that allows you to evaluate, display details for, and save the error message.

## How to Use the Metadata Integration Wizard

You can load a wide variety of models generated by other sources into a data model. Technology from Meta Integration Technology, Inc. is embedded with CA ERwin Data Modeler to provide integration capabilities with about 100 industry-leading metadata products in the form of a wizard.

There is a different wizard depending on what you need to do. To convert data from another application into a format supported by CA ERwin Data Modeler, use the Import from External Format wizard. To convert data from an CA ERwin Data Modeler model to a format supported by another application, use the Export to External Format wizard.

You use the Import from External Format wizard to do the following:

- Select the source data and other configuration parameters for the import in the Source page.
- Select the import configuration parameters for the data model data in the Destination page.
- Click the Finish button to complete the import process.

You use the Export to External Format wizard to do the following:

- Select the source data and other configuration parameters for the export in the Source page.
- Select the export data and configuration parameters for the export in the Destination page.
- Click the Finish button to complete the export process.

When you invoke either wizard for the first time, all fields are populated with default values. When you invoke either wizard again, the fields are populated with the values you entered previously.

For a list of supported bridges, see Appendix B of the CA ERwin Data Modeler Implementation Guide.

## Set Options for Import from External Format


Set the options and parameters you require in the Import from External Format wizard to convert data from another application into a format supported by CA ERwin DM.

1. Select Import, From External Format from the File menu to open the Import From External Format wizard at the Overview page.
2. Read through the overview information if necessary. You can clear the check box so that when you launch the wizard, it starts at the Source page instead of the Overview page.
3. Complete the following fields on the Source page:

### Type

Select a source type from which you want to import from the dropdown. This list is populated with the currently available bridges.

### Location

Specify the location of the source file that you want to import. You can either enter the file name and location in the box, or click the  button to open the Open dialog to search for and select the file. If you do not have a file and location specified, the page is invalid and the Finish button is disabled.

### Validation


Specify the type of validation that you want to perform on the import from the dropdown list.

### Parameters

Edit the parameter values for the selected model source type within the grid as needed. You click on a parameter and then enter a value in the Value column. Required parameters have a red flag. If you do not enter a value for a required parameter, the page is invalid and the Finish button is disabled.

4. Complete the following fields on the Destination page:

### Location

Displays the location that you selected on the Source page. This is the location to which the imported file will be saved. The same file name is used but the file extension will be that of an CA ERwin DM model. If a file by this name already exists, then the import appends a number to the file name. For example, if you already have a file name of test.erwin, the import creates test1.erwin, and so on. You must have a location specified in the Location field, or you will not be able to complete the import process. Click the  button to open the Save As dialog to change the location of where the model will be imported and saved.

### Open Model

The Open Model check box is selected by default. You select this check box to open the CA ERwin DM model you specified in the Location field. If you do not select the check box, the model is still saved, but it is not loaded into CA ERwin DM.

### Parameters

Edit the parameters for creating the \*.erwin or \*.xml file as needed. You click on a parameter and then enter a value in the Value column.

Required parameters have a red flag. If you do not enter a value for a required parameter, the page is invalid and the Finish button is disabled.

5. Click the Finish button to start the conversion process.

There is a tip text area located at the bottom of each page that displays helpful information about the active (selected) field.

### Disabled Location Field for Certain Import Bridges

For certain import bridges, the Metadata Integration requires multiple input files to complete the import, rather than a specific location of one source file. When this is the case, the Location field on the Source page of the Metadata Integration Import Wizard is disabled. You must provide a bridge parameter in the Parameters grid that will specify the directory name of where the input files are located.

The import bridges to which this applies is shown in the following list:

- CA COOL: Biz 5.1
- CA COOL: Enterprise (ADW) 2.7
- CA COOL: Xtras Mapper (TerrainMap for DB2)
- CA Gen 4.1a to 7.5
- Meta Integration Repository (MIR) XMI multimodel content
- Microsoft SQL Server Analysis Services 7.0 to 9.0 (via DSO)
- Microsoft SQL Server Reporting Services (File)
- MicroStrategy 7.0 to 8.1
- Telelogic (Popkin) System Architect 10.4 to 11.x (Encyclopedia)
- Telelogic (Popkin) System Architect 7.1 to 11.x (File)
- Visible IE: Advantage 6.1

## Set Options for Export to External Format

Set the options and parameters you require in the Export to External Format wizard to convert data in an CA ERwin Data Modeler model to a format supported by another application.

1. Select Export, To External Format from the File menu to open the Export to External Format wizard at the Overview page.
2. Read through the overview information if necessary. You can clear the check box so that when you launch the wizard, it starts at the Source page instead of the Overview page.
3. Edit the parameters for exporting the \*.erwin file as needed on the Source page. You click on a parameter and then enter a value in the Value column.


**Note:** The export process will not complete unless you have saved the model before you start the export process.

4. Complete the following fields on the Destination page:

### Type

Select a destination type to which you want to export from the dropdown. This list is populated with the currently available bridges.

### Location

This is the location to which the exported file will be saved. The same file name is used, however if a file by this name already exists, then the export appends a number to the file name. For example, if you already have a file name of test.dsx, the export creates test1.dsx, and so on. You must have a location specified in the Location field, or you will not be able to complete the export process. Click the  button to open the Save As dialog to change the location of where the model will be exported and saved.

### Parameters

Edit the parameter values for the selected destination type within the grid as needed. You click on a parameter and then enter a value in the Value column. Required parameters have a red flag. If you do not enter a value for a required parameter, the page is invalid and the Finish button is disabled.

5. Click the Finish button to start the conversion process.

There is a tip text area located at the bottom of each page that displays helpful information about the active (selected) field.

## Disabled Location Field for Certain Export Bridges

For certain export bridges, the Metadata Integration requires multiple output files to complete the export, rather than a specific location of one file. When this is the case, the Location field on the Destination page of the Metadata Integration Export Wizard is disabled. You must provide information for the Directory parameter in the Parameters grid that will specify the directory name of the location of the output files.

The export bridges to which this applies is shown in the following list:

- CA Gen 4.1a to 7.5
- IBM DB2 Data Warehouse Edition / Rational Data Architect
- IBM Rational Data Architect (RDA)
- Informatica Metadata Manager
- IRI CoSORT RowGen Data Definition File
- IRI CoSORT SortCL Data Definition File
- Meta Integration Repository (MIR) XMI multimodel content
- MicroStrategy 7.0 to 8.1
- Oracle Data Integrator- Beta
- Telelogic (Popkin) System Architect 10.4 to 11.x (Encyclopedia)
- Telelogic (Popkin) System Architect 7.1 to 11.x (File)

## Complete Compare

One of the most powerful tools CA ERwin DM provides is *Complete Compare*. It helps you easily compare and synchronize the object properties between a data model and its related database or another data model.

The Complete Compare technology includes these features:

### **Work with open models in real time**

When you select a model, database or script file, it opens as a model in the workplace and stays open during the compare process. Changes made to the models during compare are automatically made to the open models. You can save your models when you end the compare session, or use other features to update the database or replace the script file.

### **Quickly perform simple or complex comparisons**

Screens in the non-sequential wizard allow you to quickly perform a simple compare, or set up the parameters for a complex compare. You move through the wizard using a navigation tool displayed in a static explorer window. You can use preset defaults and click Compare once to start the compare process.

### **Save an entire compare session to an external (CCS) file**

You can save your compare session in a Complete Compare Session (CCS) file. You can then reload the saved session to instantly restore your previous selections, including model choices, and object and property filters.

### **Customize Options Sets**

Customize the list of objects and properties you want to participate in the compare by creating an Option Set in the Type Selection dialog. You can save the Option Set as an external file, or with one or both of the models that participate in the compare.

### **Search compare results**

Use the Find functionality in the Resolve Differences dialog to search the list of displayed differences.

### **Create reports**

Use the Report functionality in the Resolve Differences dialog to prepare a custom report of your Complete Compare session.



## The Complete Compare Wizard

You use the Complete Compare Wizard to carry out four basic steps in the Complete Compare process:

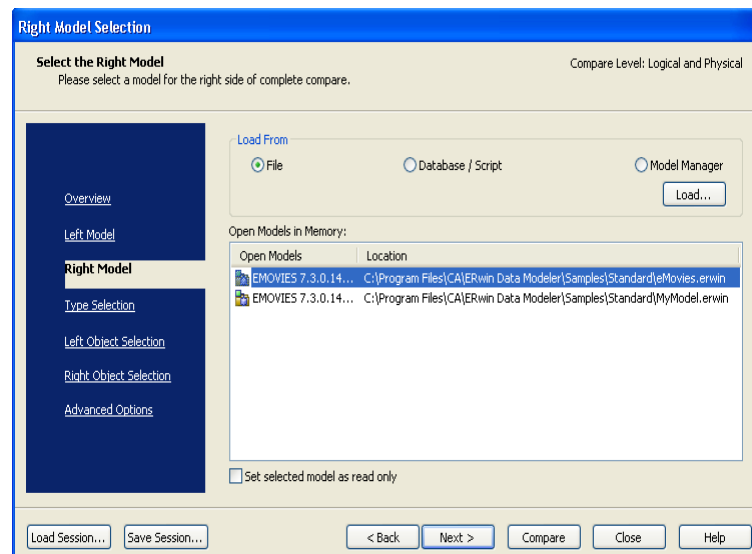
- Select the models, script file, or database to compare.
- Select objects and properties to include in the compare process, and choose filter options.
- Resolve differences.
- Save your models.

## How Model Selection Works

Select the models, script file, or database for the compare. Some of the typical compare scenarios you can use are:

- Compare your active data model open in the workspace with a model saved as an \*.erwin file.
- Compare a data model with a script or database.
- Compare two databases or two scripts.
- Compare two unrelated models.

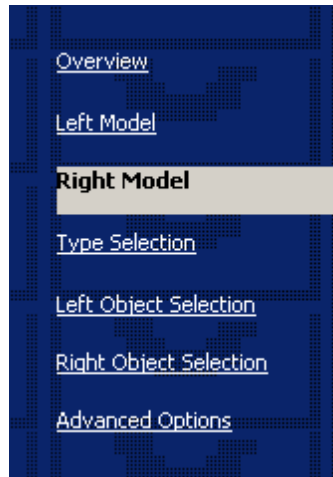
Click Complete Compare, Compare on the Tools menu. The Right Model selection dialog opens by default.



You can work with models already open in the workplace, or you can use the Complete Compare wizard to open a model, or reverse engineer a database or script file.

- Select from the "Load From" choices to open a new \*.ERWIN file, or compare to a database or script file. When you select the Database/Script option, the Reverse Engineer dialog opens, which allows you select specific options. If you have a connection to CA ERwin Model Manager, you can open a model from a library.
- Move the focus in the Open Models in Memory list to choose a model already open in the workspace.

It is easy to navigate the panes of the Complete Compare Wizard - click the name of the pane in the static explorer area in the wizard to display that pane.



Since the wizard is non-sequential, you can select as many or as few options as your want, and start the compare process at any time.

After you select the Right Model, click Left Model in the navigation pane to open the Left Model Selection dialog. Select a model, database, or script file for the "Left Model" in the compare.

**Note:** You can use the preset defaults for all the other options in the Complete Compare wizard. To accept the defaults and start the compare process, click the Compare button after you select the right and left models.

## Load a Model as Read-Only

On either the Right Model Selection or Left Model Selection pane of the Complete Compare wizard you can select the "Set selected model as read-only" check box.



When you select the check box, the model is loaded as read-only. When you work with the model in the Resolve Difference dialog, you cannot make changes to it.

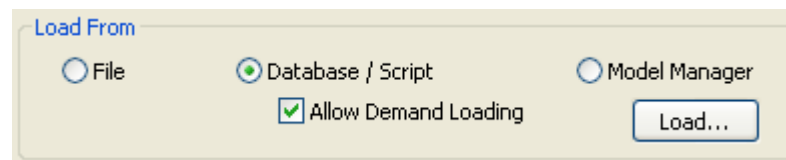
Making one of the models read-only in a compare session creates a "one-way" compare scenario - you can move objects and properties from the model to the other model, but you cannot make changes to the read-only model.

## Allow Demand Loading

When you work with a script file or database in Complete Compare, you can use the Allow Demand Loading check box to load only the names of top-level objects (tables, views, materialized views). This enables Complete Compare to load the database quickly since it is only comparing names at this point.

When you align or perform an action on a partially loaded object in the Resolve Differences pane of the Complete Compare Wizard, the properties are fully loaded in order to complete the compare action.

You suppress this default when you clear the Allow Demand Loading check box. Clear the Allow Demand Loading check box if you plan to work with the model you reverse engineered from the database or script file after using Complete Compare.



If you do not clear Allow Demand Loading, the resulting model will only be partially loaded and will be missing the substructure of various object, tables, views, and so on.

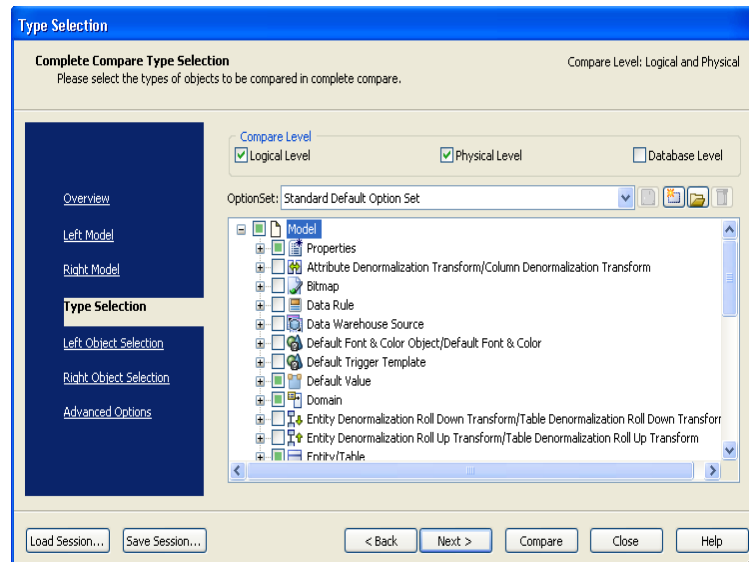
Allow Demand Loading is useful when you compare a small model or a small subject of objects to a large database. When you compare an entire large model to a large database, use of Allow Demand Loading is not appropriate.

**Note:** When working with DB Sync, to optimize performance, demand loading is turned on by default.

## Type Selection Compare Levels

You can refine the compare process by applying filters and selecting the specific objects and properties you want to participate in the compare.

Click Type Selection in the navigation pane to open the Type Selection dialog. You use features in this dialog to access type filtering options.



You can choose from three Compare Levels, provided as check boxes near the top of the Type Selection pane. The default selection is based on the kind of models you selected for your left and right models. For example, if you are working with a Logical/Physical model, you can select to include both the logical and physical level. If you are working with a logical-only model, all check boxes but Logical Level are grayed out.

### Logical Level

Includes objects on the logical level

### Physical Level

Includes objects on the physical level.

### Database Level

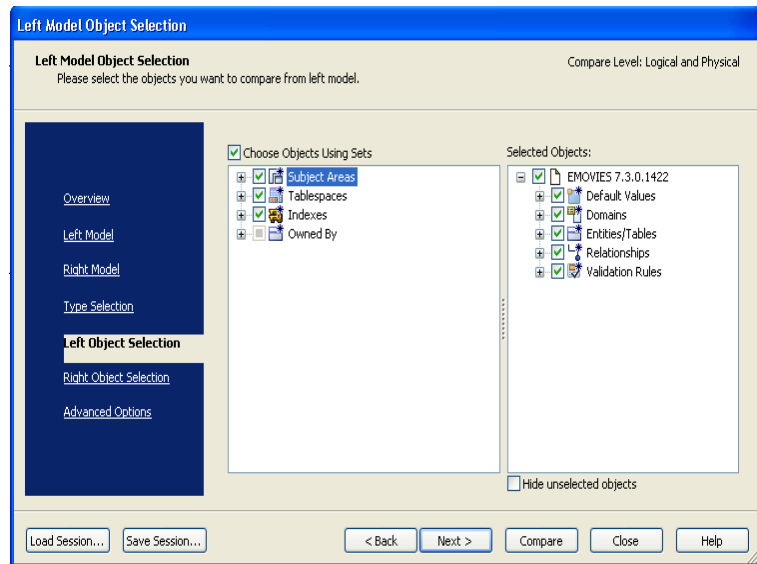
Includes objects on the database level, and excludes some physical modeling properties such as graphic fonts, colors, drawing objects, and so on.

**Note:** Check boxes can appear with a check (selected) or without a check (gray or empty). When a check displays in the box, it indicates that all the objects and properties lower on the tree are also selected. When the box is gray, it indicates that not all of the objects and properties lower on the tree are selected. An empty check box means that nothing is selected.

## Refine the Criteria for Object Comparison

You can further refine the criteria for object comparison between the left and right models.

Use the Left Object Selection and Right Object Selection panes of the Complete Compare wizard to filter out specific objects for each model.



In the Choose Objects Using Sets window you can apply preset choices for common filter selections. For example, to filter by subject areas, triggers or ownership criteria. Filter out specific objects by clearing the check box next to the object name. The selected objects displayed in the Selected Object pane changes based on the kind of compare your are performing. For example, if your left model has been reverse engineered for Complete Compare, you can choose from selection sets that allow you to perform a complete compare on new objects, system objects, or matching objects. Choose from the following options:

### Choose Objects Using Sets

Select this check box to use preset options for selecting objects sets, such as Subject Areas, Triggers, or objects by owner. The available sets appear in a tree in the wizard. Clear this check box if you plan to use a customized set of selected options from the object list.

### Selected Objects

Displays the tree of model objects for the "Left Model". Select or clear the check box next to the object name.

### Hide Unselected Objects

Select this check box to remove unselected objects from the Selected Objects display. This feature makes it easier to display the objects you selected, when you are working with a long object list.

After you have made choices for your left model in the Left Object Selection dialog, click Right Object Selection in the navigation pane to make choices for right model.

## Filter By Owner Name

You can select to filter objects by owner in both the Left Object Selection pane and Right Object Selection panes of the Complete Compare wizard. When you indicate an owner name, the Selected Objects pane is automatically updated to reflect the appropriate list of owned objects.

### To filter by owner name

1. Open the Complete Compare wizard to either the Left Object Selection or Right Object Selection pane.

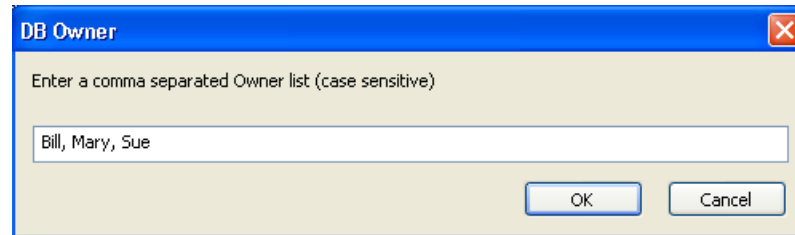
The pane includes a Choose Objects Using sets box, with an Object Tree.

2. In the "Owned By" portion of the Object tree, select the check box for Owner List (case-sensitive) or Owner List (case insensitive), then right-click the text box.

A Configure button appears.

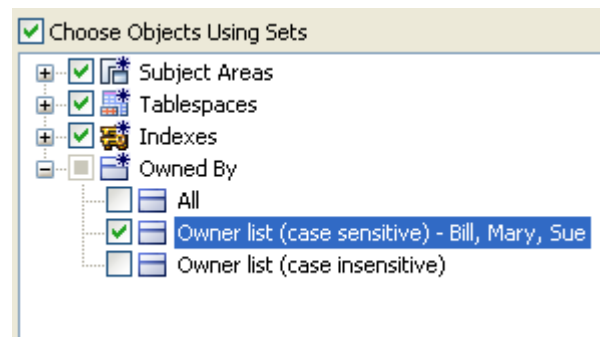
3. Click the Configure button.

The DB Owner dialog opens.



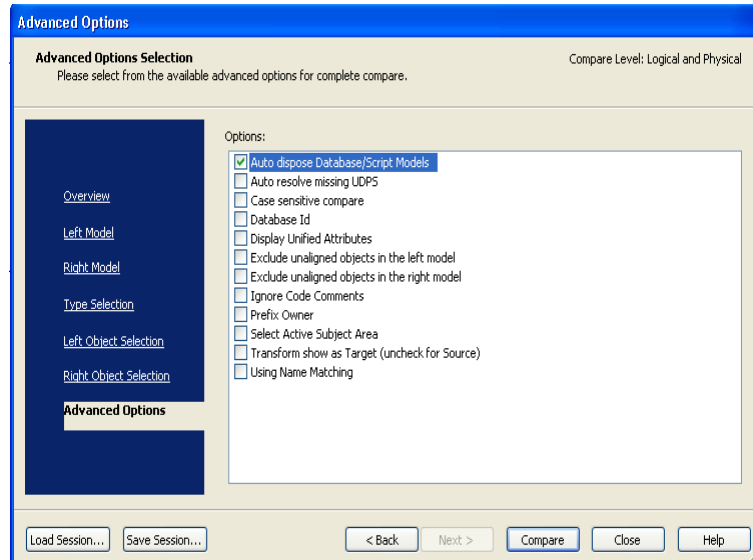
4. Enter your owner list and click OK.

The Owner List is updated with the names you entered, and the Selected Objects tree is updated based on owner criteria.



## Advanced Options

Additional filter options are available in the Advanced Options pane, for example to filter by table owner, or to apply a case-sensitive compare:



The advanced options include:

### **Auto-Dispose Database/Script Models**

When working with a database or script file in the compare wizard, select this check box to automatically close the model created from the database or script, when you end the compare session. The option to save the model is not displayed.

### **Auto-Resolve Missing UDPs**

In some cases, the Type Resolution box appears when Complete Compare detects missing UDPs or property differences for common UDPs. You can select to skip the Type Resolution popup box when all the differences are due to missing UDPs. When you select this check box, all missing UDPs are automatically copied to the target model.

### **Case-Sensitive Compare**

Perform a case-sensitive compare. This option affects both the alignment of objects in the object tree and the equality of property values in the property pane. When the option is cleared, case is ignored for the purposes of alignment and equality testing of text property values.

### **Database ID**

Match by Database ID. This option is available for Informix, Sybase, and SQL Server database servers only. When you select this option, objects are aligned based on the DB ID property if one is present.

### **Object ID**

This option is available for the DB2 database server only. When you select this option, objects are aligned based on the Object ID property if one is present on the object.

### **Display Unified Attributes**

Select this check box to simplify the display of foreign-key attributes in the Resolve Differences dialog. When selected, a Unified Attributes group object is used to display all unified attributes (role-named or not) of the same unified set of attributes.

Any attributes that are aligned to the attributes under the Unified Group object appear as part of the Unified Group object, even if they are not unified attributes.

The Unified Attributes group object carries the unified name if all the attributes under it are part of the same unified set. If not, the name consists of a comma-delimited list of names of all the attributes under it.

### **Exclude Unaligned Objects in the Left Model**

Select or clear this check box to exclude or include unaligned model-level objects from the left model in the Resolve Differences dialog. Use this option as a filter to make it easier to distinguish between changes in a model subset you are working with (such as a subject area or submodel) and a larger model of which the subset is a part.

### **Exclude Unaligned Objects in the Right Model**

Select or clear this check box to exclude or include unaligned model-level objects from the right model in the Resolve Differences dialog. Use this option as a filter to make it easier to distinguish between changes in a model subset you are working with (such as a subject area or submodel) and a larger model of which the subset is a part.

### **Display Only Aligned Objects**

You can select to display only aligned model-level objects in the Resolve Differences dialog by selecting both the Exclude Unaligned Objects in the Left Model and Exclude Unaligned Objects in the Right Model check boxes.

### **Ignore Code Comments**

Select this option to exclude blocks of comments from the body of a trigger, before including it in the compare process. This enables Complete Compare to recognize that a trigger has not changed, if the only difference is in the comment text attached to the trigger.



**Prefix Owner**

Match by prefix table owner. When you select this option, objects are aligned based on both the name and owner name property.

**Transform Show As Target (Uncheck for Source)**

Select this check box to use the target view of transformed objects. Clear the check box to show the source view.

**Select Active Subject Area**

Specifies that you want to select the active subject area by default in the Object Selection pane. This simplifies the subject area selection, especially in models that contain a large number of subject areas.

**Using Name Matching**

Match by object name. When you select this option, relationship, index, and index members are aligned based on name, in addition to the normal criteria used to align these objects.

**Tablespace in Database**

This option is available for the DB2 database server only. When the option is set, objects are aligned based on both the IN\_TABLESPACE and IN\_DATABASE properties if present on the object.

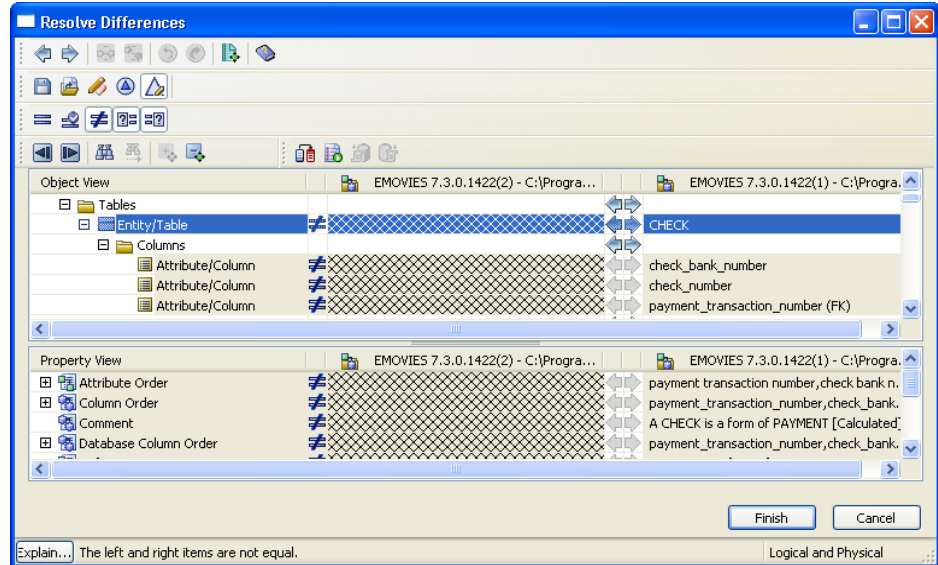
**Include Only Generated Objects**

Each editor for a physical object includes a 'Generate' check box, which is selected by default. The 'Generate' check box indicates that you want to generate SQL for this object during forward engineering. When working with a database-level compare, the 'Include Only Generated Objects' check box is selected by default. If you clear this check box, the compare session will also include those objects for which you cleared the 'Generate' check box in the property editor.

## Resolve Differences

The most important step in the Complete Compare process is comparing differences and determining how to resolve them. The Resolve Differences dialog is a side-by-side display that shows the:

- Differences between the models, databases, or script files you selected for display in the left and right panes.
- Intended resolution for each difference.



The toolbars give you quick access to all the compare options. You can reposition the five toolbars along the top of the dialog. Hold your mouse over an icon to display a tooltip for that feature. When you select a row in the object or property view area, the relevant toolbar options become active.

## Resolve Differences Dialog

Use the options in the Resolve Differences Dialog to compare the model in the left pane with the model in the right pane and resolve the displayed differences. You can view the differences on the object level, or more detailed property level. You can search the text of the comparison lists, and you can generate a report of the differences.

### **Standard Toolbar** (see page 132)

Perform a specific action on a selected item in the list of differences. For example, you can copy an item from one model to the other, match or unmatch items, and generate a report.

### **Impact Analysis Toolbar** (see page 133)

Invoke additional functionality as you resolve differences. You can view the Impact Analysis dialog and the Message Log, and generate an alter script for either the left or right model.

### **Known Differences Toolbar** (see page 134)

Mark known differences and work with snapshots. You select rows that you do not want to display in the Resolve Differences dialog, and save the list for retrieval in a future Complete Compare session.

### **Standard Filters Toolbar** (see page 135)

Filter the display of differences in order to refine the compare process.

### **Navigation Toolbar** (see page 136)

Navigate the list of known differences, search for an item, and expand or collapse the trees.

### **Object View**

Displays a list of differences between the models in an object tree. The status of the comparison is illustrated by an icon. For example, icons are displayed to show a conflict between objects, a resolved conflict, and so on.

### **Property View**

Displays the properties for the selected object in the Object View pane.

### **Explain**

Opens the Explanation dialog that displays alignment information for the selected row.

### **Status Bar**

Displays the compare status of the current compare row. For example, "The left and right items are not equal".

## Resolve Differences Standard Toolbar

The following lists the buttons that you can use in the Resolve Differences Standard toolbar and describes the purpose for each button.



### **Copy item to the left**

Moves any items that do not match, from the right model to the left model.



### **Copy item to the right**

Moves any items that do not match, from the left model to the right model.



### **Match two items**

Matches two items. Use this feature to override automatic matching. You first select an object, click the match icon, then click an object or property with which to match the first object. The items then appear on the same line in the Object View.



### **Unmatch two items**

Unmatches any items that have been matched.



### **Undo**

Undoes the last operation.



### **Redo**

Redoes a previous undo operation.



### **Show Report**

Opens the Report Dialog to generate a report of the differences between the left and right models.



### **Help**

Opens online help for the Resolve Differences dialog.

## Resolve Differences Impact Analysis Toolbar

The Resolve Differences Impact Analysis and Reporting Toolbar includes shortcuts to the following options:



### Action Log

Displays a read-only version of the Action Log. The two-pane window tracks the actions made in the Resolve Differences dialog. You can use the Find feature to search through long lists of transactions. Click the report icon to open the Data Browser and create a report on the change differences.



### Message Log

Displays advisory messages in the Message Log dialog if you encounter these messages as you work in the Resolve Differences dialog.



### Left Alter Script/Schema Generation

Generates an alter script for the model in the left pane for a compare session that includes a database or script file. The Schema Generation Alter Script dialog opens, which guides you through the alter script generation.

**Note:** Schema generation is not available when you resolve differences between a VSTS Database Edition project and a CA ERwin DM model.



### Right Alter Script/Schema Generation

Generates an alter script for the model in the right pane for a compare session that includes a database or script file. The Schema Generation Alter Script dialog opens, which guides you through the alter script generation.

**Note:** Schema generation is not available when you resolve differences between a VSTS Database Edition project and a CA ERwin DM model.

## Resolve Differences - Known Differences Toolbar

Use features on the Known Differences toolbar to mark known differences and work with snapshots. The Known Differences toolbar includes shortcuts to the following options:



### **Save Known Differences Into a Snapshot**

Save known differences as a snapshot. The Save Snapshot dialog opens, where you can set options for saving the snapshot.



### **Load Known Differences From a Snapshot**

Load a saved snapshot to your current Resolve Differences session. The Load Snapshot dialog opens, where you can select the snapshot you want to load.



### **Mark/Unmark a Row as a Known Difference**

When you select a row, and then click Mark Known Difference, you hide the selected rows in the Resolve Differences display.

Click a row, or press Ctrl+click to select multiple rows, then click the Mark Known Difference icon. You can save marked rows as a snapshot when you click Save Snapshot after you mark known differences.



### **Show Known Difference Items**

Click this button to display known differences you hid using the Mark Known Differences option. This option is disabled when a snapshot is not active, or you have not marked rows as a known difference.



### **Show Differences that have changed since the last loaded Snapshot**

If you loaded a snapshot, you can click this button to display the rows (either the left or the right) for which the property value has changed since the snapshot was saved.

## Resolve Differences - Standard Filters Toolbar

The standard filter buttons allow you to change the display of differences in order to refine the compare process. You can select any combination of filters. To show only the differences between the models, cancel the selection for the "Show Equal" and "Show Resolved Items" buttons and select the three remaining buttons.



### Show Equal Items

Indicates that you want to display objects and properties that are the same in both models.



### Show Resolved Items

Indicates that you want to display property and object rows that were resolved into equal rows during your Resolve Differences session. When you click this icon, the rows are marked with the change indicator color and the change indicator symbol in the status column.



### Show Not Equal

Indicates that you want to display all of the differences between the objects and properties in both models. This filter is selected by default when the Resolve Differences dialog opens.



### Show Unaligned Objects on the Right

Indicates that you want to display objects that do not exist in the right model, but are present in the left model. This filter does not affect property rows. This filter is selected by default when the Resolve Differences dialog opens.



### Show Unaligned Objects on the Left

Indicates that you want to display objects that do not exist in the left model, but are present in the right model. This filter does not affect property rows. This filter is selected by default when the Resolve Differences dialog opens.

## Resolve Differences Navigation Toolbar

The following lists the buttons that you can use in the Resolve Differences Navigation toolbar and describes the purpose for each button.



### Go to Previous Difference

Highlights the previous object or property difference.



### Go to Next Difference

Highlights the next object or property difference.



### Find an Item

Searches for an object or property.



### Find Next Item

Searches again, using the search parameters already established.



### Expand all




Expands the lowest branch of the comparison tree.



### Collapse all



Collapses the deepest level of the comparison tree.

## Comparison Results

The Complete Compare process presents the results of the compare in an object view and property view table. Items that do not match are tagged with the  "Not Equal" icon. If a property is missing from one of the models, the cell displays cross hatches. You can scan the table of differences by using the scroll bar on the right of the table, or clicking the  "Next Difference" or  "Previous Difference" icon on the toolbar.

## Resolve Actions

You resolve differences by synchronizing properties in your left and right model. To do this, you simply move objects or properties from one model to the other.

When you select the row you want to work with, click the  Left or  Right button on the main toolbar, or click the smaller version of the same icons in the compare row.

When items in the compare row match, no differences are displayed. The cross hatches disappear when the object properties match.



## Save a Complete Compare Snapshot

While you work in the Complete Compare Resolve Differences dialog, you can mark a row as a "known difference" and save your selections as a snapshot. When you mark a row as a known difference, you remove it from the list of differences displayed in the Resolve Differences dialog, effectively filtering it out of the compare scenario.

Before you can save a snapshot of known differences, you first select the rows you want to include in the snapshot, then click the Mark Known Difference icon.


### To save a Complete Compare snapshot

1. Click Complete Compare, Compare on the Tools menu.

The Complete Compare Wizard opens.

2. Make your selections in the Complete Compare wizard for the left and right model, and click Compare.

The Resolve Differences Dialog opens.

3. Select the rows you want to include in the snapshot, and click the Mark Known Difference icon  in the Resolve Differences Dialog.

When you mark a row as a known difference the row and all dependent rows disappear from the display.

4. Click the Save Snapshot icon .

The Save Snapshot dialog opens.

5. Complete the following fields:

#### Left Model/Right Model

You can save the snapshot with either or both models. The left model is selected by default.

#### Snapshot Name

Displays a name for the snapshot. To overwrite an existing snapshot, select it from the drop-down list.

#### Description

Displays an optional description for the snapshot.


6. Click OK.

The Save Snapshot dialog closes.

## Load a Complete Compare Snapshot

You can load a snapshot of known differences you saved previously. When you load a snapshot you apply the known differences established in the snapshot to your current compare session. The known differences identified in the snapshot are removed from the Resolve Differences dialog display.

### To load a Complete Compare snapshot

1. Click Complete Compare, Compare on the Tools menu.  
The Complete Compare Wizard opens.
2. Make your selections for the right and left model in the Complete Compare wizard and click Compare.  
The Resolve Differences Dialog opens.
3. Click the Load Snapshot icon .  
The Load Snapshot dialog opens.
4. Select a snapshot from the list and click OK.  
The saved snapshot is loaded and the Resolve Differences display refreshes.

## Manage Model Snapshots

You use features in the Manage Model Snapshots dialog to work with snapshots you created during a Complete Compare session.

**Note:** Since a snapshot is saved with the model, open the model that contains the snapshot before you begin this procedure.

### To manage model snapshots

1. Click Complete Compare, Snapshot on the Tools menu.

The Manage Model Snapshots dialog opens.

2. In the Name list, select a snapshot with which you want to work.

The dialog is populated with information from the saved snapshot. The following features appear in the dialog:

#### Delete

Deletes the selected snapshot.

#### Left Model/Right Model

Displays the path (read-only) for the model with which the snapshot is saved.

#### Description

Displays the description of the snapshot. Use the tools above the text entry area to cut, copy, paste, or edit text.



3. Click OK.

Your changes are saved and the dialog closes.

## Generate an Alter Script

You can generate an alter script based on the changes made during your compare session. For example, if you are working with a database you reverse engineered to a model, you can generate an alter script that includes the changes made during the compare session.

### To generate an alter script

1. Click the Left Alter Script  or Right Alter Script  icon in the Resolve Differences dialog.

The Alter Script Schema Generation dialog opens.

2. Follow the prompts to preview, print, save, and generate the schema.

## Save Your Models

When you start the Complete Compare wizard, your models remain open in the workplace. As you work in the Resolve Differences dialog, your open models are updated in "real-time."

### To save your models

1. Click Finish in the Resolve Differences dialog to end your compare session.

**Note:** You can make additional changes to the options in the wizard and compare again, or you can close the wizard.

2. Click Close in the Complete Compare Wizard to close the wizard.

**Note:** If the models that you compared were already open in the workplace, the models remain open. Use the standard Save options to save your work before closing the models.

The Close Models Prompt opens when you work with models loaded from a file, or from a database or script file.

3. Clear the check box for models you want to keep open in the workplace. If you select models to close, when you click OK, the Close dialog displays for each model, allowing you to save your changes.

**Note:** If you are working with a database or script file reverse engineered using the Complete Compare wizard, you have several options to save your work. You can save the changes in a new model, you can generate an alter script to update the database, or you can save the changes in a new script file.

## Additional Complete Compare Functionality

The power and versatility of the Complete Compare tool includes many additional features. Three important ones are:

- Create a Customized Option Set
- Save Your Complete Compare Session
- Create a Complete Compare Report

## Manage Complete Compare Option Sets

When you compare models, databases, or script files, a collection of all the objects and properties for your target server are displayed in a default option set on the Type Selection dialog. If you are working with a Logical/Physical model, a separate default option set is available for logical and physical objects.

The option set consists of a hierarchical tree of objects and properties. You can select or clear a check box before each object or property name to create a customized list (for example, to exclude drawing objects from the compare). You can collapse or expand the different nodes of the property tree.

Two default option sets are provided:

### **Standard Default Option Set**

This option set filters out many objects and properties from the selection tree. It excludes "physical-only" object types, and includes a minimal set of property types. Use this default for standard compares where it is not necessary to include all objects and properties in the compare process.

### **Advanced Default Option Set**

This option set includes all objects in the selection tree, except those that are assigned generated values during forward or reverse engineering. Use this default option set for advanced compares, in which you want all objects to participate in the compare process.

You can create a customized option set and save it for future use. The option set can be saved with the left or right model, or as an external XML file.

## Save a Complete Compare Option Set

Two default option sets (Standard and Advanced) appear in the Complete Compare Type Selection dialog. You can save a complete compare option set customized with a different set of objects and properties.

### To save a complete compare option set

1. Click Complete Compare, Compare on the Tools menu.

The Complete Compare Wizard opens.

2. Select the models, database, or script file you want to compare. Click Type Selection in the navigation pane.

The Type Selection pane opens.

3. In the Complete Compare Type Selection pane, make changes to the displayed option set by selecting or clearing the check boxes in the object property tree. Click the Save As icon.


The Save As dialog opens.

4. Select a destination and enter a name for the option set:

Choose from the following destination options in the "Save To" box:

- XML file - Saves the option set to an external XML file.
- Left Model - Saves the option set with the model in the left pane of the current Complete Compare session.
- Right Model - Saves the option set with the model in the right pane of the current Complete Compare session.

Enter a name for the option set in the Location/Option Set Name box:

- For an XML file, click  to name the file and select a location for the saved file.
- For an option set saved with the model, enter the Option Set name in the text box.

Click OK.

Your option set is saved.

## Save a Complete Compare Session

You can save all of the selections you make in the Complete Compare wizard, to a CCS (Complete Compare Session) file. The session file retains all compare criteria made in each pane of the wizard, including exact model names and locations, option sets, and so on. You can open the session at a later time and repeat the compare process using the same selections.

This feature saves you time when you compare the same models, databases, or script files over time. For example, you can track the differences between generated DDL and its related data model over time by reusing a Complete Compare Session each time your model or DDL changes.

### To save a Complete Compare session

1. Click Complete Compare, Compare on the Tools menu.

The Complete Compare wizard opens.

2. Use the panes in the Complete Compare wizard to select the compare criteria.

**Note:** you cannot save a Complete Compare session until you make a selection for at least the right and left pane of the Complete Compare wizard.

3. Click Save Session.

The Save As dialog opens.

4. Enter a name for your session. Click OK.


Your session is saved as a new file with the \*.CCS (Complete Compare Session) extension.

Note: If you move or change the name of either model included in a saved Complete Compare session, you cannot load that session again.

## Create a Complete Compare Report

You can create a summary report for the differences displayed in the Resolve Differences pane of the Complete Compare Wizard. You can use the report to track changes to your models over time. The report includes a summary of the differences displayed in the Resolve Differences pane.

### To create a complete compare report

1. Click the Show Report  icon on the Standard Toolbar of the Resolve Differences dialog.

The Report Dialog opens.

2. Choose one of the following formats in which to display the report:
  - Default Internet Browser (\*.HTML)
  - Microsoft Word Document (\*.doc)
  - Microsoft Excel Workbook (\*.xls)

3. Click OK.

The report opens in the selected viewer.

**Note:** You can access online documentation for all the features available in the Complete Compare Wizard. The online help also contains more examples and procedures for other compare scenarios not covered in this Guide. Click the Help button on the Complete Compare wizard to open online help. Click Index in the Help dialog to search the online help index.



# Chapter 6: Report on Your Data Model

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This section contains the following topics:

[The Report Template Builder](#) (see page 145)

[The Data Browser](#) (see page 151)

[The Query Tool](#) (see page 170)

[Use Crystal Reports With CA ERwin Data Modeler](#) (see page 174)

## The Report Template Builder

You can use the Report Template Builder to easily and quickly create reports about your model. You can create reusable report templates and export results in txt (.csv), HTML, RTF, and PDF formats. You can view and save your reports to share with others using a web browser. You can also import components from reports created in the Data Browser to the Report Template Builder.

The reporting user interface uses two main components:

### **Report Templates Dialog**

Lets you quickly run a report on your open model using an existing template.

### **Report Template Builder**

Lets you design a new report template and set customization options.

You can run a report from either the Report Templates Dialog, or the Report Template Builder.

## The Report Templates Dialog

When you click the Report Builder on the Toolbar, or choose Report Builder on the Tools menu, the Report Templates dialog opens.

Use the features on this dialog to run a report on your current model using an existing template.

### **Available Templates**

Lists existing report templates in the current path.

### **New**

Opens the Report Template Builder dialog where you can create a new report template and specify the content, format, and properties of the report.

### **Edit**

Opens the selected report template in the Report Template Builder.

### **Run**

Generates the selected report template to the output type you select (see Output Type below).

### **Browse**

Opens a dialog where you can change the path.

### **Output Type**

Select HTML, RTF, TEXT, or PDF as the output type (see Run above).

## Generate a Preformatted Report

Before you create a new report template, you can run one of the preformatted reports available.

### **To generate a preformatted report:**

1. Click the HTML Entity Primary Key.rtb report in the Available Templates pane.

The description for the report displays in the Report Template Definition pane, and the output type automatically displays as HTML for this report template.

2. Click Run to create the report.

The report is created and your web browser automatically opens to display the HTML report.

## New Report Template

When you click the New button in the Report Templates dialog, the Report Template Builder dialog opens. This is where you specify the content, format, and properties of the report.

### Create a Report Title and Set Export Format

When you create a new report, you should begin by assigning the report title and confirming the choices for generating a table of contents, and specifying the output format.

#### To create a report title and set the export format

1. In the Report Template Builder, select Document Untitled at the top of the Report Layout pane, and click the Properties button on the toolbar.

The Properties dialog opens.

2. Select the Has Table of Contents check box if you want the report to contain a table of contents.

**Note:** This applies to HTML and RTF reports only.

3. Select the export format. When you generate the report, the following report-viewing software is automatically launched:

#### HTML

Opens your browser.

#### RTF

Opens the local copy of a word processor, for example, Microsoft Word.

#### TEXT

Opens the required program for .CSV (Comma Separated Values) files, for example, Microsoft Excel.

#### PDF

Opens the Adobe Acrobat Reader to display the report. You can also save the report in PDF format.

**Note:** You can specify export format details in the Export tab of the Properties dialog.

4. Click the Title tab in the Properties dialog, and enter a title for the report template. You can also specify font and color options, and add macros to the text to add information such as the current model name and current date.

The title options appear.

5. Click the Header and Footer tabs in the Properties dialog to set header and footer text, fonts, and colors.

6. Click the Definition tab to enter the report template definition or any other information. The text you enter appears in the Definition box in the Report Templates dialog.
7. Enter "Basic Report on Model:" directly over the Document Title, and be sure to place a space at the end of the title before performing the next step.
8. Ensure that the Model name macro is selected and then click the Add Macro button.

The macro is inserted into the Document Title field in the Properties dialog. The model's name will be appended to the report title.

**Note:** Additional macros are available in the drop-down list.

9. Select the Export tab of the Properties dialog and verify that HTML is the report output type.

If HTML is not report output type, choose HTML from the Export As list.

10. Select Picture Reports as Pop-Up Windows in the HTML Export Properties group box. This option creates pop-up links for the graphical elements in your HTML report output.
11. Close the Properties dialog.

The Report Template Builder pane opens.

**Note:** If you prefer, you can keep the Properties dialog open while you create a report template. Just move the dialog to the side to give you more room to work.

## Add Sections to the Report Template

You can quickly you can add report sections and report columns to your report template. A report section is a model object that has properties to report on. For example, Attribute, Domain, and Relationship are available report sections.

To add a report section in the report template, double-click the section name in the Available Sections pane, or select the section then click the right-arrow button. Each section you add to the report template displays in the Report Layout pane with the default display columns.

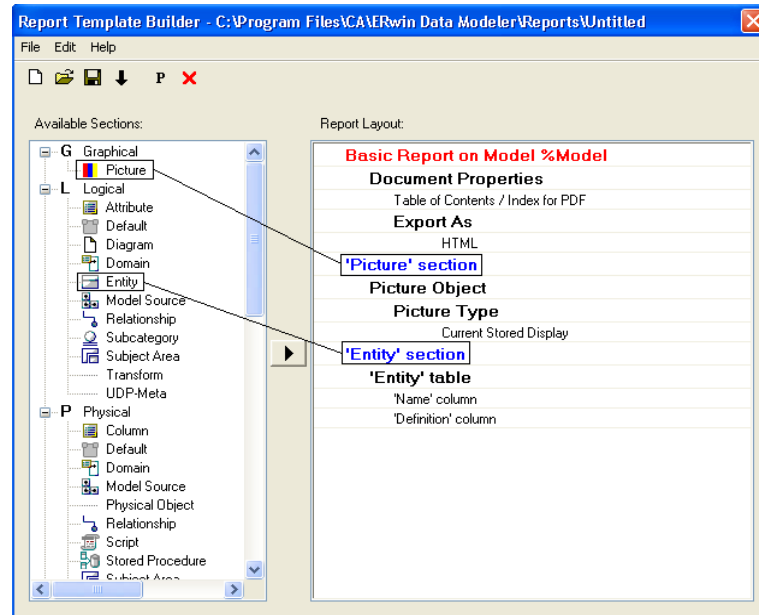
### To add report sections to the report template:

1. Open the Report Template Builder.
2. Select Picture in the Available Sections pane, and click the right arrow.

This section is added to the Report Layout pane.

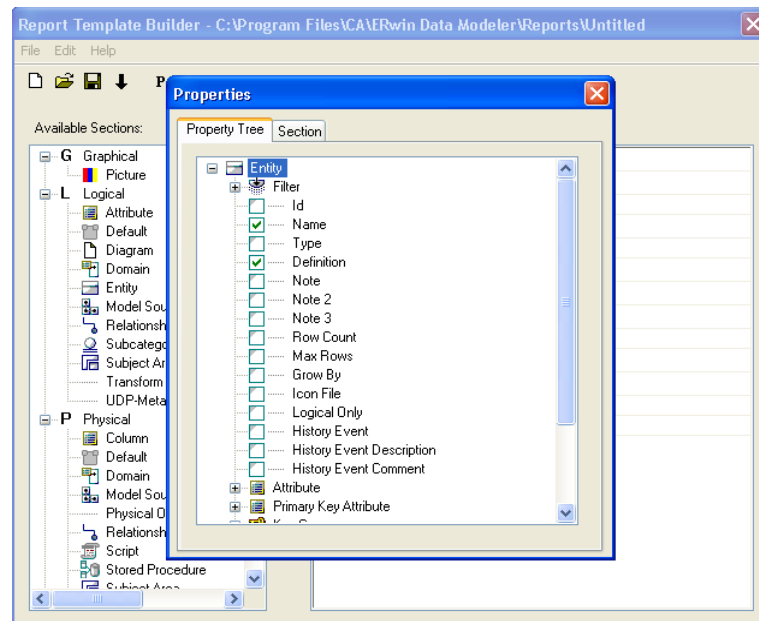
3. Select Entity (in Logical Section) in the Available Sections pane, and click the right arrow.

This section is added to the Report Layout pane.



4. Double-click the Entity section in the Report Layout pane.

The Properties dialog opens. The Property Tree for Entity includes all the properties you can select for this object.



5. Click the plus sign to expand the Entity tree, and select the Name and Definition check boxes.

6. Click the plus sign to expand the Attribute tree, and select the Name check box.
7. Close the window to return to the Report Template Builder.  
The properties you selected are now included in the Report Layout.
8. Click Save on the Report Template Builder toolbar.  
Your report template is saved.

## Section Properties

You can define additional properties to sections you have added to your report layout. Double-click anywhere in a section to open the Properties dialog with options for that section.

For example, when you double-click the Entity section in the Report Layout pane, you can click the Section tab to display options to change the section name, and define fonts and colors. You can also set the section layout as hierarchical or tabular, and align the section name left, centered, or right.

## Table Properties

When you create a report section, the Report Template Builder automatically creates a corresponding Table that lists the section columns. You can use the Properties dialog to change columns and to apply table properties such as the table name, fonts, and colors.

For example, when you double-click the Entity Table item in the Report Layout pane, the Properties dialog opens.

Select the Table tab to display options to change the table name, and define fonts and colors. You can also align the table name left, centered, or right.

## Report Template Preferences

You set global preferences for your reports using the Preferences dialog. You can set the following report template preferences:

- General defaults that include specifying the text for the %Author and %Organization macros.
- Color and font defaults for the Title, Sections, Tables, Columns, Column cells, Headers, and Footers.

- Export format defaults (HTML, RTF, PDF, and Text) and related properties.
- Specify a graphics file and URL to display on the first page of HTML reports.

You can also use the Preferences dialog to apply formatting changes to existing report templates.

To open the Preferences dialog, click Preferences on the Edit menu.

## Generate a Report

After you have made the selections for your report layout, and have set report properties and preferences, you can generate a report. Select a report output from the Report Layout pane, then click the Run icon in the Report Template Builder toolbar to run the report. The report generates the selected output format and automatically starts the related application.

- For HTML output, the Report Template Builder generates HTML complete with links to diagram object properties. This is true for hierarchical, tabular, and picture reports.
- For RTF output, the Report Template Builder generates RTF output to MS Word complete with TOC field codes (if selected), title page, headings, and page breaks.
- For PDF output, the Report Template Builder uses the formatting preferences for RTF reports, but launches the Adobe Acrobat Reader to display the report. You can also save the report in PDF format.
- For TEXT output, the Report Template Builder generates text output to MS Excel.

## The Data Browser

The Data Browser is a versatile and highly-customizable tool for browsing and generating reports on models and database information.

If you are using the Data Browser without a connection to CA ERwin Model Manager, the Data Browser provides a set of predefined report types (categories) for models. Each report type contains a set of related options that you can include or exclude in your report. Some report types also provide built-in filtering and sorting options. You select a report category and use it as the basis for creating a report that includes only the options you want. Once you create the report, it appears in a reporting folder so you can print the report again.

The Data Browser shows the result set generated by the report, and adds a result set icon (📄) to the tree control under the report icon. You can then use the Data Browser features to customize the content and change the appearance of the result set.

You can also use the Data Browser to search for and find the information you want in a result set. You can specify a search expression, which can include strings, numbers, or dates, for one or more columns so that the Data Browser finds only the result set rows that satisfy all the search expressions. You can find a change of value in a column and hide result sets rows that do not match the search.

If you are using the Data Browser with a connection to CA ERwin Model Manager, the Data Browser provides two sets of predefined reports organized in a folder tree under two folders called General and MM Reports <MartName>.

### Standard Data Browser Reports

The Data Browser includes a set of standard reports that you can use to report on your current model. The Standard report file (Standard.erp) resides in the install folder, by default, c:\Program Files\CA\ERwin Data Modeler\Reports.

- Entity reports
- Attribute reports
- Column reports
- Domain reports
- Model validation reports
- Subject area reports
- Table reports
- Stored procedure reports
- Relationship reports
- View reports



## Create a Report

You can use the Options tab in the Report Editor to specify the information you want to include in a report. The options you select become columns in a result set generated by the report. A pencil icon next to an option indicates that the corresponding column in the generated result set is editable.

### To create a report

1. Click Data Browser on the Standard toolbar.

The Data Browser opens.

2. Click New report or folder on the toolbar.

The New Object dialog opens.

3. Double-click on the report item.

The Reports dialog opens.

4. Select the following options:

#### **Name**

Displays the name of the report.

#### **Category**

Displays type of report you want to generate. The options in the list change based on whether you click Logical or Physical.

#### **Logical**

Filters the Category list to show only those reports available for the logical model.

#### **Physical**

Filters the Category list to show only those reports available for the physical model.

#### **Option tab**

#### **Edit**

Displays all report options in the Options list.

**Show Selected Only**

Displays only the currently selected report options in the Options list.

**Show Selected**

Expands only folders in the Options list that contain selected items. Unselected items in these folders are also shown.

**Collapse All**

Closes all open folders except the first folder.

**Clear All**

Clears all previously selected options.

**Options**

Displays the information you can include in a report. The options available depend on the report type selected in the Category list. Expand or collapse each folder to select three possible types of options:

**Check box options**

Select the check box next to an option to include that information in the report. A pencil icon next to an option indicates that the corresponding column in the generated result set will be editable.

**Filter options**

Click the plus sign next to a Filter By folder to view the filtering options. Click one or more of the filter buttons to include only rows in the report that satisfy the filter options you select.

**Sort By options**

Click the plus sign next to a Sort By folder to view the sorting options. Click on one of the Sort By buttons to sort the report rows using the option you select.

**Definition tab**

Displays a definition for the report.

**Note tab**

Displays a note for the report.

5. Click OK.

The report is added to the tree control in the main Data Browser window.

6. Click Execute report.

The report is run against the active model.

## Edit a Report

You can use the Options tab in the Report Editor to specify the information you want to include in a report. The options you select become columns in a result set generated by the report. A pencil icon next to an option indicates that the corresponding column in the generated result set will be editable.

**Important:** When the report is run from the Entity/Table level asking for attribute/column names, and if some of the attributes/columns are marked as logical or physical only, or even if there is a difference between the number of displayed attributes and columns because of any transform, the report shows the displayed attributes and columns but the attributes and columns will not necessarily correspond to each other in the same line. This gives the appearance of mismatched attributes and columns, but the report is behaving as expected. If you want to see which attribute matches which column, then you need to run the report at the Attribute/Column level.

### To edit a report

1. Click Data Browser on the Standard toolbar.

The Data Browser opens.

2. Expand the folder that contains the report you want to edit, select the report you want to edit, and click Edit properties on the tree control toolbar.

The Report Editor opens.

3. Edit the reporting options from tree control:

#### **Options**

Select the check box next to an option to include that information in the report. A pencil icon next to an option indicates that the corresponding column in the generated result set will be editable.

#### **Filter options**

Click the plus sign next to a Filter By folder to view the filtering options. Click one or more of the filter buttons to include only rows in the report that satisfy the filter options you select.

#### **Sort By options**

Click the plus sign next to a Sort By folder to view the sorting options. Click on one of the Sort By buttons to sort the report rows using the option you select.

#### **Definition**

Edits the definition for the report.

#### **Note**

Edits the note for the report.

Click OK.

The report is updated.

4. Click Execute report.

The report is run against the active model.

## **Generate a Report Using the Data Browser**

When you generate a Data Browser report, the Data Browser shows the result set generated by the report in the Result Set pane on the right side of the dialog. A result set icon is added to the tree control under the report icon. The following naming convention is used for reports: <Report Name> (<Time>, <Number of Rows>).

#### **To generate a report using the Data Browser**

1. Click Data Browser in the Standard toolbar.

The Data Browser opens.

2. Expand the folder that contains the report you want to generate, and double-click the report icon.

The report is generated. The result set is displayed for the report in the Result Set area of the Data Browser window and a result set icon is added under the report in the tree control.

3. Edit the result set:
  - Double-click an editable cell. A cell is editable when the cursor changes to a pencil when you drag the cursor over the cell. All editable cells in the select row change to editable text boxes.
  - Edit the text in the cell.
  - Click Save on the Data Browser toolbar to save your changes to the .erwin model.
4. Customize the result set.

## Report (ERP) Files

During installation, the setup program saves a standard Reports file (Reports.erp) in the same directory as the program files. The Reports file contains the names and definitions of predefined reports that are supplied, and the customized reports and report folders that you create. The Reports file contains the following information:

- The name of each report in the file, which includes a description of where the report is located in the folder hierarchy.
- The definition of each report, which includes the selected options that define the content and structure of the report.
- Formatting information for a report, if applicable.
- Definition text for a report, if applicable.
- Note text for a report, if applicable.

The CA ERwin DM Reports list is created in the Data Browser based on the content of the .erp file. In addition, the Data Browser provides options on the Reports menu that you can use to create new .erp files, open different .erp files, and save the active .erp file using a different name.

The name of the active .erp file is displayed as an extension to the Reports folder name in the tree control, for example, CA ERwin DM Reports [Myreports.erp]. The name of the active .erp file is also stored in the [REPORTS] section of the Erwin.ini file. Each time you open the Data Browser, the Erwin.ini file obtains the last selected Reports file, then it reads the Reports file and populates the Data Browser tree control.

When you open a model created in an earlier version of the program, any named reports stored with the model are imported into a new folder called Reports from <model name> under the CA ERwin DM Reports folder and are automatically included in the Reports file.

A backup copy of the default Reports file (Reports.erp) called REPORTS.ERK is kept, which you can use to restore the default set of reports, if necessary.

## Control Duplicate Reports in the Data Browser

When you create a report using the Data Browser, any duplicate items are automatically eliminated from the report. For example, you can run the preformatted report for Entity Name and Definition listed under Entity Reports in the CA ERwin DM Reports tree. The output displays only unique attribute names, while it does not list duplicate attribute names.

You can change the report output by using features provided on the Report Format dialog to revise the report output to include duplicate entries.

### To control duplicates reports in the data browser

1. Open a model that includes duplicate items. For example, open a model that has duplicate attribute names.

The model displays.

2. Click Data Browser on the Tools menu.

The Data Browser dialog opens.

3. Run a report that includes the duplicate item from your model and click Report format options. For example, if you have duplicate attribute names in your model, run the Entities/Attributes report found under Entity Reports on the CA ERwin DM Reports tree in the upper left pane of the Data Browser dialog.

The Report Format dialog opens. You can also open this dialog when you right-click on the newly generated report in the Entities/Attributes tree and select the Edit report format option.

4. Click the column that you want to use to display the duplicate items from the Column Options tab of the Report Format dialog. For example, click the Entity/Attribute Name column. With the selected column highlighted, click the Heading... button.

The Column heading popup dialog opens.

5. In the Column heading popup dialog, insert an exclamation point before the column heading name and click OK. For example, change the column heading Entity Attribute Name to !Entity Attribute Name.

Your changes are saved and the Column heading popup dialog closes.

6. Click OK in the Report format dialog.






In the main Data Browser dialog, the duplicate items now appear in the column you selected for display.

**Note:** When you run another report in the same category, the program defaults are again applied and no duplicate items appear. You must reset the report format for each report you create.

## How Icons Identify the Data Browser Tree Control

The tree control displays the Data Browser reports and result sets as an indented outline based on their logical hierarchical relationship. The caption bar above the tree control shows the currently selected root node of the tree.

The meaning of each tree control symbol is shown below:

-  Report Folder
-  Report
-  Editable Report
-  Result Set
-  Report View

Shortcut menus are provided to perform functions on the objects displayed in the tree control.

## Display a History of Generated Result Sets

Use the Result Set History dialog to display a list of all the result sets generated in the current session in chronological order. When you double-click on a result set in the Result Set History dialog, the result set displays in the Result set area in the Data Browser main dialog, and the icon for that result set is highlighted in the tree control. This is an easy way to locate the result set icon that corresponds to a result set.

### To display a history of generated result sets

1. Click Data Browser on the Standard toolbar.

The Data Browser opens.

2. Click Display browse history.

The Result Set History dialog opens.

3. Select the result set you want to view and click the Display button.

The Data Browser displays the selected result set and selects the result set icon in the tree control.

4. Click Close.

The dialog closes.

## Customize a Result Set View

You can change the formatting of the result set displayed in the Data Browser, including:

- The order in which columns are displayed.
- The appearance of each column (visible or hidden, bold, grayed).
- The column headings.
- The order in which the rows are displayed.
- Whether or not certain rows are displayed.
- The icons associated with report values.

Once you have made your changes and you are satisfied with the way the results are presented, you can save them in a named report view. The report view appears in the tree control, and you can generate it just like a predefined report. This means that the work of developing an effective presentation needs to be done only once. A single report can have many views, and you can switch between views without regenerating your result set.

## Report Format Options

The Report Format dialog includes two tabs. Use the options to select column format options and sort options.

### Columns Options Tab

Use the features in the Columns Options tab to select specific columns you want to appear in your result set, and change the order and appearance of columns.

### Sort Tab

Use the features in the Sort tab to customize your view of the result set by sorting on columns, or changing the order of sorted columns, or both.

## Select the Columns to Include in the Result Set

You can use the Column Options tab in the Report Format dialog to select only the columns that you want in the result set.

### To select the columns to include in the result set

1. Click Data Browser in the Standard toolbar.  
The Data Browser opens.
2. Double-click on a report.  
The result set displays.



3. Click Report format options.

The Report Format dialog opens.

4. Click the Column Options tab, and select the Visible option in the Option list. Select the check box next to each column that you want to appear in the result set and click OK.

The Data Browser redisplay the result set, which now contains only the columns you specified.

## Sort a Result Set on One or More Columns

You can use the Sort tab in the Report Format dialog to customize your view of the result set. You can sort the result set on one or more column (ascending or descending) and change the order of the sorted columns.

### To sort a result set on one or more columns

1. Click Data Browser in the Standard toolbar.

The Data Browser opens.


2. Double-click on a report.

The result set displays.

3. Click Report format options.

The Report Format dialog opens.

4. Click the Sort tab and select the check box next to the column in the Columns list box that you want to sort in the result set.

The Data Browser displays the column you select in the Sort Columns list. By default, each new sort column is automatically assigned an ascending order sort type indicated by the  symbol next to the column. Repeat this step for each column that you want to sort.

5. Optionally, select a column in the Sort Columns list and click the Ascending or Descending button to change the sort order type for the selected column. Repeat this step for each column that you want to sort. Click OK.

The Data Browser displays the result set with the sort order you specified.

**Note:** You can sort on any column in the result set regardless of whether it is displayed or not. A sort column can contain any type of data, such as numbers, strings, or dates. String sorting is independent of case.

## Assign an Icon to a Result Set Value

You can use the Icons dialog to assign an icon to a result set value so that each occurrence of the value is easily identifiable in a result set. Icons enhance your view of a result set and you can incorporate them into a report view. The Data Browser provides a set of predefined icons for this purpose. You can also specify the position of the icon (left, right, or centered) relative to the value.

### To assign an icon to a result set value

1. Click Data Browser on the Standard toolbar.

The Data Browser opens.

2. Double-click on a report.

The result set displays.

3. Click Associate icons with result set values.

The Icons dialog opens.

4. Select the icon positioning option you want in the Style box, and drag the icon you want from the Icons list to a value in the currently displayed result set.

The Data Browser assigns the icon you selected to each occurrence of the value in the result set.

**Note:** To change the icon assigned to a value, drag the new icon to the value in the result set.

## Find Result Set Rows that Match the Specified Search Criteria

You can use the Find in Result Set dialog to quickly find information in a result set. You can customize your search to find and mark the first row in the result set that satisfies your search conditions or all rows in the result set that satisfy your search conditions.

### To find result set rows that match the specified search criteria

1. Click Data Browser on the Standard toolbar.

The Data Browser opens.

2. Double-click on a report.

The result set displays.

3. Click Find in result set.

The Find in Result Set dialog opens.

4. Select the column on which you want to search and enter the search criteria in the String or Number Expression box. Use the text below the box as a guideline for the permitted expression syntax.

After you specify an expression, a binocular symbol displays next to the column in the list.

5. Define search expressions on other columns by choosing any of the following options:

#### **Find First**

Finds the first result set row that satisfies all of the search expressions you have defined for selected columns. The Data Browser displays a match symbol (🔍) next to the first row where the column values match the search expressions.

#### **Find Next**

Finds the next result set row that satisfies the search expressions defined for the selected columns, click Find next in result set.

#### **Find All**

Finds and marks all result set rows that satisfy the search expressions defined for the selected columns. The Data Browser displays a match symbol (🔍) next to all rows where the column values match the search expressions.

To clear the search expression for a column, select the column, then click the Clear button.

## **Find a Change of Value in a Result Set Column**

You can use the Find in Result Set dialog to quickly find information in a result set. You can customize your search to find and mark the rows in the result set where the value in a column changes from the previous value.

#### **To find a change of value in a result set column**

1. Click Data Browser on the Standard toolbar.

The Data Browser opens.

2. Double-click on a report.

The result set displays.

3. Click Find in result set.

The Find in Result Set dialog opens.

4. Select the column in which you want to find a value change and the Find Value Changes check box and click Find First.

The Data Browser displays a match symbol (■) next to the first row where the selected column value changes.

5. Select any of the following options:

**Find Next**

Finds the next change of value in the selected column.

**Find All**

Finds and marks all rows where the selected column value changes. The Data Browser displays a match symbol (■) next to all rows where the column value changes.

## Hide Result Set Rows that Do Not Match Search Criteria

You can use the Find in Result Set dialog to quickly find information in a result set. You can customize your search to hide all the rows in the result set that fail to satisfy your search conditions.

**To hide result set rows that do not match search criteria**

1. Click Data Browser in the Standard toolbar.

The Data Browser opens.

2. Double-click on a report.

The result set displays.

3. Click Find in result set.



The Find in Result Set dialog opens.

4. Select the column on which you want to search, enter the search criteria in the String or Number Expression box. Use the text below the box as a guideline for the permitted expression syntax.

After you specify an expression, a binocular symbol displays next to the column in the list.

Optionally, repeat to define search expressions on other columns.

5. Select the Hide Unmatched check box and optionally, select the Collapse/Expand check box to display the result set in outline and detail form. Click the Find All button.

The Data Browser displays only rows that match the search criteria. If you selected the Collapse/Expand check box,  displays next to each matched value. Click  to view the unmatched values.

## Save a Data Browser Report

You can save a report in a new reports file.

### To save reports in a new reports file

1. Click Data Browser in the Standard toolbar.

The Data Browser opens.

2. On the Reports menu, select Save Report File As.

The Save As dialog opens.

3. Select a drive and directory, select a name for the Reports file, and click Save.

The Reports File is saved with an .erp extension.

## Save a Report View

After you make formatting changes to your result set, you can save them as a named report view, which functions exactly like a predefined report. The report view icon appears in the tree control under the report or the editable report on which it is defined, and you can generate it by double-clicking it. Report views also display in the Most-Recently Used list in the toolbar and in the Available Reports display for a result set row. You can even drop a result set row on an eligible report view to run the report.

A report view includes all result set format changes, including column ordering, heading changes, sorting options, icon assignments, and search criteria. You can define several report views for the same report. You can even switch between report views for the same result set without re-generating the report, simply by dragging the result set icon and dropping it on the report view you want to see.

#### **To save a report view**

1. Click Data Browser in the Standard toolbar.

The Data Browser opens.

2. Double-click on a report.

The result set displays.

3. Customize the report format and click Save view.

The Save Report View dialog opens.

4. Enter a name for the report view in the View Name box and optionally, if you want to include one or more parameters as part of the report view, select the check box next to each parameter you want to include. Enter a description of the report view in the Description box and click OK.

The Data Browser saves the report view with the name you specify and adds a report view icon to the tree control under the report from which the view was generated.

## **Print a Result Set**

You can print a result set.

#### **To print a result set**

1. Click Data Browser in the Standard toolbar.

The Data Browser opens.

2. Double-click on a report.

The result set displays.

3. Click Print on the File menu.

The Print Result Set dialog opens.

4. Work with the available printing options, then click OK.

Your result set prints.

## Set Print and Page Layout Options

You can use the Print Result Set dialog to select the page range, the area of the result set to be printed, the number of copies, the output format, and the page width overflow options.

### To set print and page layout options

1. Click Data Browser in the Standard toolbar.  
The Data Browser opens.
2. Double-click on a report.  
The result set displays.
3. On the File menu, select Print.  
The Print Result Set dialog opens.
4. Select the print options you want.

#### **Page Setup**

Specifies layout, font, and text options for printing a result set.

#### **Print Preview**

Previews each page in a result set before you print it.

#### **Printer**

Opens the standard Windows Print Setup dialog.

5. Click OK.  
The print and page layout options are set.

## Page Setup Dialog Options

You can use the Page Setup dialog to specify layout, font, and text options for printing a result set. The Page Setup dialog includes the following tabs:

### **Layout**

Sets the style of the grid lines, the size of each margin, the page orientation, and the position of the image area on the printed page. A graphic in the lower right corner of the tab provides a visual indication of the page layout and highlights in red text the currently selected page setup parameter.

### **Fonts**

Sets the font, size, and features of the various text elements such as column headings, in the result set printout. You can use fonts to enhance the appearance of a result set and make it easier to view and understand.

### **Text**

Customizes the appearance of a result set printout by changing the default headers, footers, page numbers, and titles that appear on the printed result sets.

## Export a Result Set

You can use the Export from Data Browser dialog to export a result set generated by the Data Browser to a comma-separated values (CSV) or HyperText Markup Language (HTML) file. You can also export a result set to RPTwin or another application that supports Dynamic Data Exchange (DDE), such as Microsoft Word.

### **To export a result set from the Data Browser**

1. Click Data Browser on the Standard toolbar.  
The Data Browser opens.
2. Double-click on a report.  
The result set displays.



3. On the File menu, click Export.

The Export from Data Browser dialog opens.

4. Select one of the following options in the Export format list:

**HTML**

Generates an HTML file. The resulting output can be displayed in any Web browser or imported into another application such as Microsoft Word or Excel.

**DDE**

Outputs the result set to another application that supports Dynamic Data Exchange (DDE) such as Microsoft Word.

**CSV**

Generates a comma-separated values (CSV) file. The resulting output can be imported by most spreadsheet applications including Microsoft Excel.

**RPT Win**

Outputs the result set to RPTwin.

**BRS File**

Outputs the result set to a BRS File.

5. Select one of the available options in the Presentation group box:

**Tabular**

Exports the result set in a tabular format similar to the manner in which the result set is displayed on screen.

**Tabular with duplicates**

Exports the result set in a tabular format in which all values display, including those that are duplicated.

**Master-detail**

Exports the result set as a mix of headings and subtables. The Data Browser uses the relationships between model components to determine which values are printed in headings and which values are printed in tables.

**Indented**

Exports the result set as a mix of headings and lists. The Data Browser uses the relationships between model components to determine how the values are indented.

**Item per line**

Generates a result set as a list with one item on each line.

6. Select one of the following options in the Export to group box:

**File**

Exports the result set to a file.

**Clipboard**

Exports the result set to the Clipboard. This option is not available if you select DDE or RPTwin as the export format.

7. Click Export.

The result set is exported.

## Exit the Data Browser

When you exit the Data Browser, any report views you create for future sessions are saved. However, report result sets are not saved. If you want to save your result sets for the next session, you must explicitly move them to a new folder.

To exit the Data Browser, click Exit on the Data Browser File menu.

## The Query Tool

The Query Tool provides an easy way to execute SQL SELECT queries against a model in CA ERwin Data Modeler or against a database catalog. You can execute a query against the objects and properties in the model, the metadata defining those objects and properties, and the action log that records the changes that are made to your model during the modeling session.

You can create new queries or paste text from another source (such as a \*.sql file) into a query.

You can save a query to a \*.qry file for later execution. Query results can be saved to a \*.csv (comma-separated values) file.

Although the Query Tool provides a built-in query interface in CA ERwin Data Modeler, you can also use any third-party reporting tool that has ODBC capability to query CA ERwin Data Modeler modeling data.

**Note:** For more information on using CA ERwin Data Modeler's ODBC data sources with a third party tool, see the *ODBC Reporting Guide*, which is located in the Doc subdirectory of your CA ERwin Data Modeler installation.

## Create a Query

You can create a query (SELECT statement) by entering text directly in the Query box, or by pasting text from another source.

### To create a query

1. Click Query Tool on the Tools menu.  
The Query Tool opens.
2. Enter your query in the Query box, or click the paste button on the toolbar to paste a query from another source.  
Your query is ready for execution. Use other features in the Query Tool to execute and save the query.

**Note:** Before you can execute a query you must be connected to ERwin ODBC or to a database.

## Open a Query

You can work with queries you saved to a \*.qry file in a previous session, or you can optionally use a \*.sql, or Microsoft SQL Server Query file.

### To open a query

1. Click Query Tool on the Tools menu.  
The Query Tool opens.
2. Click the Open Query icon on the toolbar.  
The Open dialog opens.
3. Select a \*.qry or \*.sql file and click open.  
The query text opens the Query box and is ready for execution.

**Note:** Before you can execute a query you must be connected to ERwin ODBC or to a database.

## Save a Query

After you have created a new query or made changes to an existing query in the Query Tool, you can save your query to a \*.qry file for future use.

### To save a query

1. Click the Save Query icon on the toolbar in the Query Tool.

The Save As dialog opens.

2. Select a file name and location for your query, then click Save.

Your query is saved and the Save As dialog closes.


3. Click Close.

The Query Tool closes.

## Execute a Query

You can execute a new or saved query against the model or against a database catalog.

Use the following process to execute a query:



- Open the Query Tool from the Tools menu.
- Create a new query or open an existing query (\*.qry) file.
- Connect to ERwin ODBC or to a database.
- (Optional) Select the option to restrict row count and enter a number to indicate the number of rows by which to restrict results.
- Click the Execute  icon on the toolbar.

After your query executes, the results display in the Results box. Use other features in the Query Tool to save the query or save your result set.


## Execute a Query Against a Database

You can run your query against a database catalog. To do this, you connect to the database from the Query Tool and then execute your query.

Follow this process to run a query against a database:

- Open the Query Tool from the Tools menu.
- Create a new query or open an existing query (\*.qry or \*.sql) file.
- Click the Connect  icon on the toolbar.
- Enter the database-specific connection criteria in the Connect dialog.
- (Optional) Select the Restrict row count to check box and enter a number to limit the number of rows returned.
- Click the Execute  icon on the toolbar.

After your query executes, the results display in the Results box. Use other features in the Query Tool to save the query or save your result set.

**Note:** You cannot be connected to ERwin ODBC and a database at the same time in the Query Tool. If you are connected to ERwin ODBC, the (database) Connect icon is dimmed. Click the Disconnect  icon on the toolbar to disconnect your ERwin ODBC connection before you attempt to connect to a database.

**Important!** Before you can make a database connection, the appropriate database client software must be installed. Read the [Database Connection Overview](#) (see page 110) for more information.

## Execute a Query Against ERwin ODBC

To run a query against the current CA ERwin Data Modeler model, you must first activate the ODBC connection. The connection may already be active, if you selected the option to start the ODBC driver on the Integrations tab of the Options dialog.


### To connect to ERwin ODBC


1. Click Query Tool on the Tools menu.

The Query Tool opens.

2. Open a query (\*.qry or \*.sql) file or create a new query.

Query text displays in the Query box and is ready for execution.

3. Click the Connect to ERwin ODBC  icon on the toolbar.

The ODBC connection is established. The Disconnect  icon becomes active. Use other features in the Query Tool to execute and save the query and result set.

## Use Crystal Reports With CA ERwin Data Modeler

You can use Crystal Reports to query the CA ERwin DM metadata and build reports on an open model. Use this process to create a report:

- Start CA ERwin DM and open the models you want to report on. This ensures that the data source is loaded and available to Crystal Reports when you begin.
- Start Crystal Reports and identify ERwin or ERwin\_Current as the current data source. You can do this when you create a Blank Report or work with the Report wizard. A user name and password are not required to access the ERwin data source - you can leave these fields blank and click Finish.

**Note:** If you see a "Logon failed" message, it is probably because you do not have CA ERwin DM open. When you start CA ERwin DM, it loads the data sources and makes them available to Crystal Reports.

- Build your report from ERwin schema objects. For example, work with modeling data using the M0 Schema, metadata using the M1 schema, the EM0 schema, the EM1 schema, or the AL schema.

For more information on the schemas, see the *ODBC Reporting Guide*, Chapter 3. For detailed information about the CA ERwin DM metadata, see the *Metadata Reference Guide*. Both guides are available from the Start menu, and are installed to the \Doc folder where you installed CA ERwin DM.

# Chapter 7: Working with Design Layers

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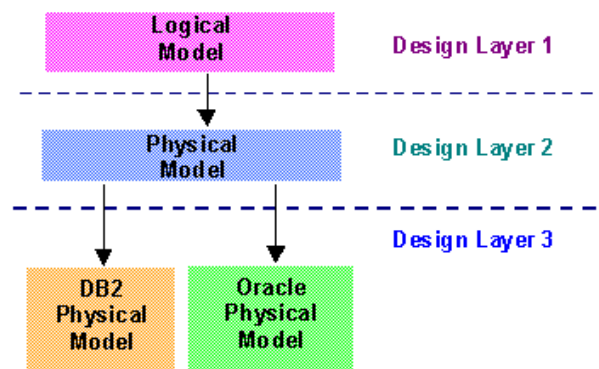
This section contains the following topics:

[Design Layers](#) (see page 175)

## Design Layers

A *design layer* is a single data model or set of data models used for a particular purpose in the application development processes. Each design layer is part of a hierarchy of two or more design layers.

In the simplest view of design layer hierarchy, the first design layer is a logical data model that captures the business requirements for an application. Then in a second design layer, those business requirements are transformed into database implementation rules in a physical data model. A generic physical model may be created using generic ODBC as the target database. A third design layer may represent different physical implementations of the same data model, but on different target server platforms.



## Design Layer Hierarchy

Generally, in a design layer hierarchy, different model types are used for a distinct purpose in the application development lifecycle. However, you must be able to develop and link related models in different design layers. Within each design layer, you must be able to make and record design decisions that transform the structure from one layer to another. Finally, you must be able to maintain the links between the models in different design layers and to synchronize changes made in different layers while maintaining the appropriate structures in each. The combination of linking models in different design layers using model sources and applying transforms within a model provide the capability to create a successful hierarchy.

For example, a logical model may represent business requirements and rules. From that model, a generic physical model may be derived, in which physical constructs are designed for a generic database. Once the generic physical model is considered stable, you can derive from it multiple database specific models. In this way, the generic physical model becomes the standards model.

A variety of features are necessary to support the separation of model types and to keep related models linked and in sync.

## Who Creates Design Layers

Typically, the application development process involves many groups in an organization such as Standards Administrators, Business Analysts, Data Modelers, Data Administrators, and Database Administrators (DBA) who create design layers.

Your application development requirements and methodology determine how many people or groups are involved in the process in your organization.

## The First Design Layer: The Conceptual Logical Data Model

CA ERwin DM delivers a superior approach to visualizing database structures and facilitating the design of Logical and Physical data models. This structured, systematic approach to information management and application development begins with a conceptual Logical model, the first of several design layers to capture your specific business requirements (including generic entities and supertype/subtype structures).

## The Second Design Layer: The Generic Physical Model

You use the generic physical model to establish the structure of the tables and columns and to create the generic naming needed to represent your business application. But, in the physical generic data model, the objects and properties are independent of a database. Other database-specific data models can be derived from a generic physical data model.



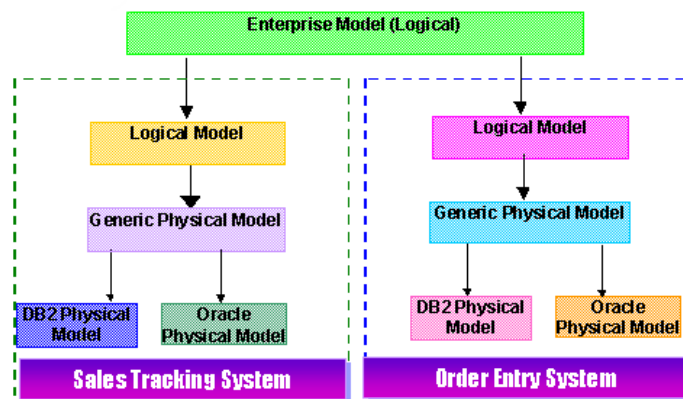
### The Third Design Layer: Database-specific Physical Models

You can create a database-specific physical design layer that will be used for your database implementation. Each application can run on several database platforms; a final design layer is needed for database-specific data models.

### Enterprise Model Hierarchy

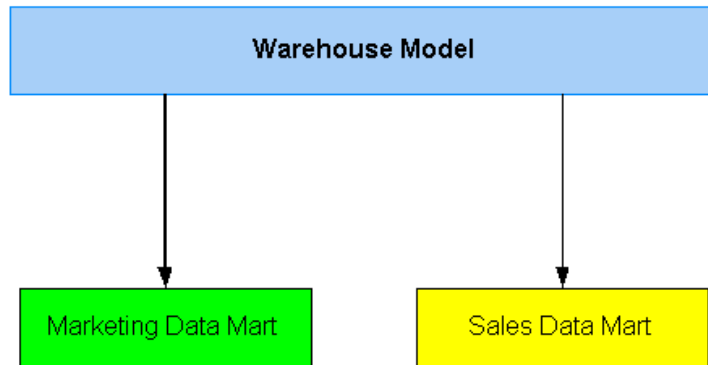
In another example, the conceptual data model may instead be an enterprise-level data model, which establishes the standards for all applications across the organization. The enterprise-level data model may be Logical and include all of the approved standards for entities and attributes that the organization supports. The next design layer may have multiple Logical data models for multiple business applications, such as an Order Entry application and a Sales Commission application.

While these are very different types of applications, it is likely that they share some common entities such as EMPLOYEE and CUSTOMER. The enterprise-level model may include both of these entities along with others that may not be selected for either of these application-specific models. In this hierarchy, the next design layer may be a generic Physical model for each application. If each application runs on several database platforms, a final design layer is needed for database-specific data models.



## Data Warehouse Hierarchy

A data warehouse requires additional layers for models of the entire warehouse and data marts. Options in the physical model for dimensional notation and for features related to data movement (data source information, data transformation rules) are provided that let you optimize for warehouse models.



## New Design Layers

Many features support design layer architecture such as Split L/P Model, Derive New Model, Add Model Source, Link Model Source, and Sync with Model Source.

All of the design layer features are wizard-driven, which means that you are guided through a series of dialogs to select the appropriate options and enter the necessary information.

### Split a Logical/Physical Data Model

If you want to separate a logical/physical model into two models - a logical-only and a physical-only - you can use the Split L/P Model option, which is on the Tools menu.

When you split a model, you are prompted to save the separate logical and physical data models with different names. When you save the new models, the logical model becomes the source of the physical model, which is necessary for synchronizing changes between the two model types. The original logical/physical model is preserved with its original name.

#### To split a logical/physical data model

1. Open a logical/physical model you saved previously.
2. Click Split L/P Model on the Tools menu.

The Split Model/Logical Save As dialog opens.

3. Save the logical side of the model with a new name.

The Split Model/Physical Save As dialog opens.

4. Save the physical side of the model with a new name.

**Note:** If you are using CA ERwin Model Manager on the same computer, and have established a connection to the database, you can choose to save your new models to the CA ERwin MM database.

The new logical and physical models, and the original logical/physical model remain open in the main workplace.

## The Derive New Model Wizard

Whether you have a logical/physical model or a logical-only or physical-only model, creating a new model is easy. Rather than copying objects from one model to another or create a new one, the Derive New Model wizard takes a step-by-step approach to help you derive a new model from a model source. The original model is used as the source for the new model. When you work on the separate models, the changes to each model can be synchronized at any time.

## Derive a New Model

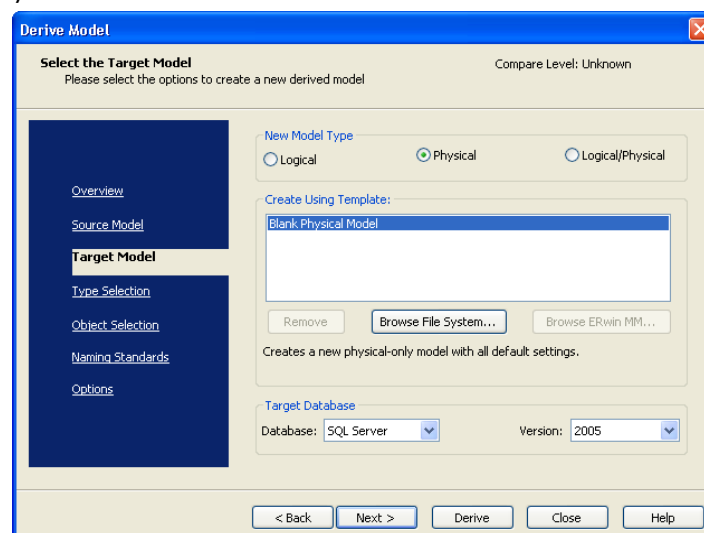
Use the Derive Model Wizard to derive a new model from an existing model and transition from one design layer to another.

**Note:** You must save your model before you derive a new model from it.

### To derive a new model

1. Open an existing model, then click Derive New Model on the Tools menu.

The Derive New Model wizard opens on the Target Model pane, and identifies your current model as the source model for the derive action.

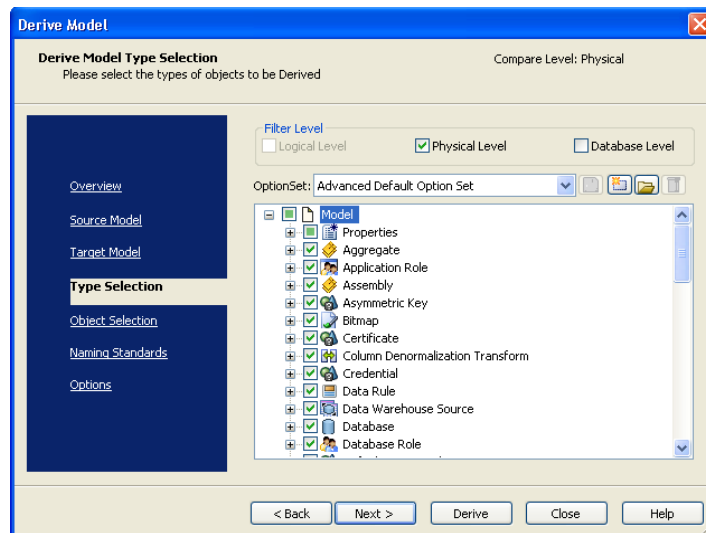


2. Select the following options, and click Next:

- In the New Model Type group box, select Logical, Physical, or Logical/Physical.
- In the Create Using Template box, accept the default template, or browse for a template.
- Select a target database and version from the drop-down lists.

**Note:** Because the wizard is non-sequential, you can start the derive process at any point when you click Derive. You can also customize the derive process using features on the other panes. For example, you can set the compare level, and select specific objects to derive. You can also use a customized option set of objects and properties. You can apply more object filters in the Object Selection pane, and indicate how transforms are handled during the derive process in the Options pane.

The Type Selection pane of the wizard opens.



3. Accept or edit the remaining defaults, and click Derive.

Your new derived physical model appears in the main workplace.

## The Model Source

A *model source* is the parent model that is linked to another model for the purpose of synchronizing changes. Hidden identifiers are automatically assigned to objects in the model source and the linked model. Changes made to both models are tracked using the object identifier. Then, you can synchronize the changes even if the object's name changes.

Sometimes building a design layer hierarchy requires linking two models that already exist rather than deriving a new model from an existing model. For example, you may have a generic model that you want to designate as the model source to other database-specific models. In this case, you can add the generic model as the model source to the database specific model. When you add a model source, you designate the objects and properties that you want the model source to contribute to the target model.

## Add a Model Source

To add a model source, click Add Model Source on the Tools menu. The Add Model Source wizard uses a step-by-step approach to help you specify the objects that you want to add to the target model. The objects are added to the target model and links the objects so that you can later synchronize any changes.

You can add multiple model sources if you want objects to be contributed by multiple models. After you add a model source, you can use the Model Sources Properties dialog to view and edit information about the model source. Choose Model Sources on the Model menu to open the Model Sources Properties dialog.

## The Link Model Source Wizard

If you want to simply match existing objects in two models, creating a link between the objects, use the Link Model Source tool. Unlike the Add Model Source, Derive Model, and Sync with Model Source features, the Link Model Source tool creates no new objects in the target model. However, you can maintain or update linked objects using the Sync with Model Source tool.

To link your current model to a source model, choose the Link Model Source option on the Tools menu. The wizard presents all the options you need for selecting a source model and creating the links.

Regardless of which method you choose to build a design layer hierarchy, the ability to link models and synchronize changes between models is critical.

## Model Source Properties

Whether you add a model source by splitting a model, deriving a model, adding a model source, or linking a model, CA ERwin DM keeps track of the model source and manages the links between the model and its source objects.

When you add a model source, a new object is created in the Model Explorer.

Right-click the model source name in the Model Explorer and click Properties to open the Model Sources Properties dialog. Use features in this dialog to view general information, add a description, add user-defined properties, and change the model source naming rules.

**Note:** You can also access the Model Source Properties dialog when you click Model Sources on the Model menu.

### The Sync with Model Source Wizard

A relationship between a model and its source can be created as the result of splitting a logical/physical model, deriving a model adding a model source, or linking a model. Once a model has a model source, the changes to the objects that were contributed by the model source are automatically tracked. At any time, you can use the Sync with Model Source wizard to import and export changes between a model and its source.

The Sync with Model Source wizard takes you step-by-step through the process of selecting the types of objects and changes that you want to compare and synchronize. You can also define case conversion and maximum length rules for logical and physical model objects, and specify a file to enforce naming standards in the target model. The result is a side-by-side list of changes that were applied to either the source and/or the target model.

Whether you import or export changes, the models and the Model Sources Properties dialog are updated with the date of the synchronization.

## Transforms

A *transform* is a method by which you can apply and maintain a record of a *design decision*, which is a decision to change objects or properties within a design layer. When applied, a transform changes a set of objects from one state to another for the purpose of refining, normalizing, or denormalizing a model. The main advantages of using transforms include:

### **Automation**

The refinement of the logical and physical model are simplified. You can use wizards to automatically apply design layer changes, instead of manually applying changes.

### **Traceability**

Historical information for each model object that the transform creates is maintained. You can trace the history of transformed objects.

### **Preservation of object properties**

The properties of the transformed objects are preserved. (You do not have to manually reenter the information.)

## Transform Wizards










For each transform, a wizard is used to perform the transform steps. As you go through the wizard, you select options and respond to prompts.

Before applying the transform, the wizard shows you the results that you get when the transform is complete.





When you click Finish on the last page of the wizard, the participating objects are transformed into their new state and a record of the transform is added to the Model Explorer under Transforms.

## Transform Toolbar

The Transform Toolbar provides a set of tools to apply transforms. The model type and the objects that you want to participate in the transform determine which tools are available on the Transform Toolbar. Supported transforms include:

-  Many to Many
-  Supertype-Subtype Identity
-  Supertype-Subtype Rollup
-  Supertype-Subtype Rolldown
-  Vertical Partition
-  Horizontal Partition
-  Roll-Down Denormalization
-  Roll-Up Denormalization
-  Column Denormalization

The toolbar also includes options to:

-  Show Transform Source Objects
-  Show Transform Target Objects
-  Reverse All Transforms
-  Resolve All Transforms

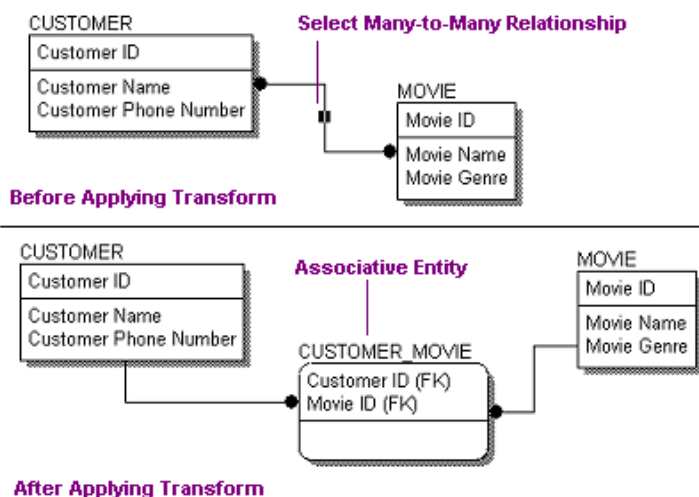
In most cases, when you select the objects that you want to transform, the appropriate tools on the Transform Toolbar become available. For example, to apply a Supertype Subtype Rollup transform you must first select the supertype/subtype symbol.



## How a Transform Works

The Many-to-Many transform is probably the best example to demonstrate the transform process. To use this transform, you must have two entities connected by a many-to-many relationship. Often, to resolve this type of relationship, an association entity is added between the two original entities and connected to each with an identifying relationship. By using the Many-to-Many transform, the many-to-many relationship is automatically dissolved and replaced with an association entity and two identifying relationships.

After selecting the many-to-many relationship line for the objects you want to transform, click the toolbar button to open the Many-to-Many transform wizard. Then, you simply respond to a series of questions that determine how the transform is applied. The wizard clearly lays out the post-transform results. When the transform is finished, the participating objects are transformed.



## Transform Default Options

You can change the transform default options. In the example of the Many-to-Many transform wizard described above, by default the association table is named by combining the name of the two tables participating in the transform. As you work with the transform wizard, you have the option to change the default name of the association table that replaces the many-to-many relationship.

Some transforms wizards include the option Reflect Changes Back to Source Objects. If you select this option, any change that you apply to the target (transformed objects) applies to the source objects as well.

## Transform Name Options

Every transform is assigned a default name that describes it. You can change the default name in the wizard or later in the Model Explorer (right-click the transform name in the Model Explorer to open a dialog that enables you to modify the properties). You can also add a note or a comment.

## Expected Transform Results

Two important events occur when a transform is applied. The first is that the physical appearance of the participating objects changes to reflect the purpose of the transform. The second is more subtle, a record of the transform is added to the Model Explorer under the Transforms node of the object tree.

**Note:** You can also understand the before and after state of the transform in terms of the Source display and Target display.

## Transforms and the Model Explorer

Each time you apply a transform, the Model Explorer is updated with a new item on under the Transforms folder. The transform is identified by the name you assigned it in the transform wizard, or with a default name. Right-click the transform name to open the Modify Properties for Transform dialog. You use this dialog to modify any aspect of the transform from basic options (name, definition, UDPs) to specific parameters (such as partition criteria).

## Source or Target Display Options

You can select to display either the source or target objects for a transform in your model. The display options vary slightly, if you are working in a logical/physical model, a logical-only model, or a physical-only model. The following defaults are used for new transforms:

You can choose to display either the source or target objects in any model type for any transform.

You can change the display for just one transform using the shortcut menu on the Model Explorer. Right-click the transform name and select either Show Target Objects or Show Source Objects.

You can change the display for all the transforms in your model by selecting Show Transform Source Objects or Show Transform Target Objects from the Edit menu, or when you click the option on the Transforms Toolbar. Your display choice is reflected with a check next to the option on the Edit menu, and a change in the color contrast for the item on the Transforms Toolbar. Your choice is also saved with the model.

For Logical/Physical models you can use options on the Model Properties Dialog, General tab to set transform options. You can set a default to show transform source objects in the logical model, and target objects in the physical model. Options are also available to control how Many-to-Many and Supertype-Subtype relationships are resolved when you apply these transforms in a Logical/Physical model.

## Resolve and Reverse Transforms

Two methods are provided for undoing a transform. You can *resolve* or *reverse* a transform. When you resolve a transform, the target model objects that the transform creates are preserved but the source objects are deleted.

To resolve a transform, in the Model Explorer right click the transform name. From the shortcut menu, choose Delete and Resolve Transform.

**Note:** If you have a model source linked to the model in which the transform was applied, the link between the transformed objects and the source objects in the model source is broken when the transform is resolved.

When you reverse a transform, the source objects are preserved and the transform and the model objects that the transform creates are deleted .

To reverse a transform, in the Model Explorer right click the transform name. From the shortcut menu, choose Delete and Reverse Transform.

**Note:** If you want to reverse or resolve all the transforms in your current model, click the Reverse all Transforms or Resolve All Transforms icon on the Transforms Toolbar.

## Preserve Model History

You can save historical information for your model, entities, attributes, tables and columns. Using the History feature, you can track meaningful changes to derived and transformed models, as well as routine information about the creation and revision dates of your models.

## Set History Options

### To set history options

1. Click Model Properties on the Model menu.  
The Model Properties dialog opens.
2. Select the History Options Tab.
3. Select or clear the history options for the model objects whose history you want to preserve.

You can save historical information for the following events:

- When you create a logical model and add entities and attributes.
  - When you create a physical model and add tables and columns.
  - When you derive a physical model from a logical model and create tables and columns in the derived physical model.
  - When you split a logical/physical model into independent logical and physical components.
  - When you apply a transform.
  - When you reverse engineer a database or script file and create tables and columns in the new model.
  - When you add a model source that contributes tables and columns to a model.
  - When model objects are imported using Complete Compare, or via the API.
4. Click OK.

The Model Properties dialog closes.

# Chapter 8: Naming and Datatype Standards

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This section contains the following topics:

[The Model Naming Options Dialog](#) (see page 189)

[The Naming Standards Editor](#) (see page 190)

[Check Name Compliance in a Model](#) (see page 192)

[Name Hardening Wizard](#) (see page 193)

[Datatype Standards](#) (see page 196)

## The Model Naming Options Dialog

There are a wide-range of naming standard features that can help you develop new standards or implement existing standards in your modeling environment. To manage naming standards, use the features available in the Model Naming Options dialog, and the Naming Standards Editor.

Click Names on the Tools menu, then select Model Naming Options to open the Model Naming Options dialog.

You use the features in this dialog to define the naming standards for the current data model. Some of the available features are described below.

### Specifying Case and Length Rules

You specify the case and length rules for each model type on both the Logical and Physical tabs in the Model Naming Options dialog.

Default settings are applied. However if you do specify the case and length for an object, when you close the Model Naming Options dialog, all object names are immediately changed to match your preferences.

### Mapping Logical and Physical Names

You set name mapping preferences on the Name Mapping tab. By default, a macro is applied to define the object name, but you can replace the default macro by opening the macro toolbox. You can also specify that the attached glossary file (.nsm) be the source of the name and abbreviation for some objects.

You can also supply a Prefix and/or a Suffix to the default object name and define how special characters and spaces in a logical name map to a physical name.

### **Specifying Duplicate Name Rules**

On the Duplicate Names tab, you can specify your preferences for how duplicate entity and table names are handled in a model. The preference options include:

#### **Allow**

Permits duplicate names.

#### **Rename**

Renames the duplicate name by appending to the end of the name a forward-slash to indicate that the name has been used in the model and a number to indicate how many times (for example, MOVIE\_COPY/2).

#### **Ask**

Gives you the opportunity to keep the duplicate name or enter another name.

#### **Disallow**

Requires you to change the duplicate name to a unique name.

### **Attaching a Naming Standards File**

On the General tab, you can specify the name of the Naming Standards file that you want to attach to this model.

When you attach a naming standards file to a data model, the standards and conventions defined in the file are automatically applied. You can also use the file to check compliance of the names of objects in the model, which is similar to a spell checker in a word processing application. The naming standards file is used as a dictionary and compares the names in the data model to the names in the dictionary. When it finds a discrepancy, you decide whether to ignore or replace the non-compliant name.

## **The Naming Standards Editor**

Click Names on the Tools menu, then click Edit Naming Standards to open the Naming Standards Editor.

You use the features in the Naming Standards Editor to specify separate naming standards for logical and physical objects.

In the Glossary tab on the Naming Standards Editor, you can either import an existing names glossary or build one from scratch. You can define how these standards are implemented, and create entries including business terms, and abbreviations, that are relevant to your business. Naming standards information is saved in a naming standards file (\*.nsm). For each model in which you use naming standards, you must attach a naming standards file. You can apply a naming standards file to multiple models.

## Object Name Syntax

The syntax of logical and physical object names can be classified into the following parts:

### **Prime Word**

Describes the subject area of the data such as Account, Employee, and Customer.

### **Class Word**

Designates the major classification of data that is associated with a model object such as Date, Amount, Rate, Number, Code, or Name.

### **Modifier (or qualifier)**

A word that further defines or distinguishes the prime and class words. For example, you can use the modifier Last to further define the Name class word or the modifier Corporation to further define the Employer prime word. You can specify up to two modifiers.

When you click the Logical or Physical tab in the Naming Standards Editor, you see a list of pre-defined objects in the first column. For each object type, you can use the additional columns to specify the syntax for each part of the object's name. So, for example:

- For Entities, the first part is typically a Prime Word, such as EMPLOYEE.
- For Attributes, the first part is typically a Prime Word followed by at least one Modifier such as Employee Address.
- For Domains, the first part is typically a Class Word, such as Number.

## Object Names Glossary

The Glossary consists of logical and physical object names. You can import an existing glossary or create one from scratch by typing object names and abbreviations directly into the editor. You can also specify the syntax parts associated with a particular object type (i.e., prime, modifier, and class).

## Save a Naming Standards File (.nsm)

After you define the naming standards, you need to save it in the Naming Standards editor to attach it to models.

### To save a Naming Standards file

1. Click Save As on the File menu.  
The Save As dialog opens.
2. Enter the file name, select NSM as the file type, and click Save.  
Your file is saved and the dialog closes.

## Check Name Compliance in a Model

After you attach a naming standards file, you can use it to check the names in the data model. It works like a spell checker in a word processor.

### To check name compliance in a model

1. Select Names from the Tools menu, and click Check Standards Compliance.  
The Check Name Standards Compliance dialog opens.
2. Select the objects whose names you want to check for conformance. Also, check the box if you want to check word order and position conformance.
3. Click Start.  
The name checking process begins, and when it finds a non-conforming name, it presents the name in the Non-conforming Name box.
4. Select to either ignore or replace the non-conforming words.



## Name Hardening Wizard

The Name Hardening Wizard provides a way to override inheritance of names and block name changes or resets within a model. Using the wizard, you can select the object types and object instances for which you must harden logical names or physical names, or both, within the model instead of using the inherited name values.

You can harden names in this wizard for the following object types:

- Attributes/Columns
- Default value
- Domains
- Key groups/Indexes
- Relationships
- Entities/Tables

**Note:** See the information about entity name hardening in the **Type Selection** section.

- Validation rules

The wizard also includes the flexibility to specify whether to override name inheritance for all object instances of the selected object types, a subset of those object instances, or a specific object instance using the various pages of the wizard. The wizard contains four pages:

### Overview

Contains an overview of the Name Hardening Wizard.

### Type Selection

Displays the available object types that you can select for which you want to override inheritance such as Attributes, Default Values, and Domains. To make object type selection easier, you can right-click anywhere on this page to display a context menu where you can select either the Select All or Select None option. The options you select on this page are reflected in the next page of the wizard, the Object Selection page.

**Note:** While you are able to select the Entity check box in the Type Selection page in a logical model, name hardening can only be enabled in the physical model. Logical entity names are not inherited names; they are set on the entity object. Therefore, they do not change and there is no need to harden them.

### Object Selection

Specifies the model objects or groups of model objects (collection nodes) for which you want to override inheritance. When you have transitioned to this page from the Type Selection page, all the selections that you made on the Type Selection page are listed and selected on this page.

The collection nodes have check boxes that summarize the state of the objects under that node (subordinate objects). The check boxes for the collection nodes have three states. If none of the subordinate objects are selected, the check box for that collection node is not selected. If all the subordinate objects are selected, then the check box for that collection node is selected. If some of the subordinate objects are selected, then the check box for that collection node is selected, and is also shaded. Clicking the collection node check box allows toggling of the selection of the entire set of subordinate objects. In addition, you can right-click anywhere on this page to display a context menu where you can select either the Select All or Select None option. Any selections you make to the Selection Sets section on this page are immediately reflected in the Selected Objects section.

### Action

Reflects the current name hardening settings for the selected objects. The Logical and Physical columns indicate the status of the objects and the Selected Objects column lists their fully qualified names, for example, instead of simply 'a,' an attribute name would be 'OwnerName.E/1.a.' Also, each object has a check box for selection; if you want to override inheritance, or harden, select a check box for the object; clear a check box for an object for which you want to unharden the name. When you unharden an object name, the same name you used in the hardening process remains, however, now you can edit or reset that name (editing or resetting of hardened names is not allowed).

**Note:** Unhardening an object name does not automatically restore inheritance, it only allows the names to be reset or changed.

**Note:** If you prefer, you can select all the objects directly on the diagram, launch the wizard, and go directly to the Action page. The objects you select on the diagram populate the Type Selection and Object Selection pages.

## Override Name Inheritance

You can select the object types and object instances for which you need to set logical and physical names within the model instead of using the inherited name value, or for which you need to block name changes.

### **To override name inheritance**

1. Click Names, Name Hardening from the Tools menu.  
The Name Hardening Wizard opens.
2. In the left pane, click Type Selection.  
The Type Selection page opens.
3. Select the object types for which you want to override inheritance, then click Object Selection.  
The Object Selection page opens.
4. Select the model objects for which you want to override inheritance, then click Action.  
The Action page opens.
5. Select the check box for each item for which you want to override inheritance, then click Finish.  
Inheritance is overridden for each item you selected, and the Name Hardening Wizard closes.

## Unharden Object Names

If you used the Name Hardening Wizard to set the names of selected object types or object instances (or both) in order to remove inheritance, you can unharden the names of those selected object types and object instances using the Name Hardening Wizard as well. When you unharden an object name, the same name you used in the hardening process remains, however, once the unhardening process is complete, you will have the ability to edit or reset that name (editing or resetting of hardened names is not allowed).

**Note:** Unhardening an object name will not automatically restore inheritance, it only allows the names to be reset or changed.

### To unharden object names

1. Click Names, Name Hardening from the Tools menu.  
The Name Hardening Wizard opens.
2. In the left pane, click Type Selection.  
The Type Selection page opens.
3. Select the object types that you want to unharden, then click Object Selection.  
The Object Selection page opens.
4. Select the model objects that you want to unharden, then click Action.  
The Action page opens.
5. Select the check box for each item for which you want to unharden the names, then click Finish.  
The name for each object that you selected is unhardened, and the Name Hardening Wizard closes.

## Datatype Standards

A *datatype* is a predefined set of characteristics for an attribute or column that specifies field length, acceptable characters, and optional and required parameters. For example, the datatype *char(18)* specifies that the column can store up to 18 alpha and numeric characters.

By default, a datatype is applied to every attribute in a logical model and to every column in a physical model. In the logical model, the datatype is determined by the domain from which the attribute inherits its properties or from the datatype that you assign. In the physical model, the datatype is determined by the default value specified by the target server or the datatype that you assign. Considering the large quantity of attributes or columns a data model usually has, it can be quite tedious to manually assign and maintain consistency of datatypes. For this reason, there are several tools that help you with this task.

## The Datatype Standards Editor

Use the Datatype Standards Editor to edit the default datatype mapping for your logical and physical models. For physical models, you can edit the default datatype that is automatically attached to each column. For logical models, you can add logical datatypes and assign the datatypes to the attributes in the logical model.

To open the Datatype Standards Editor, click Datatypes on the Tools menu and then click Edit Datatype Standards. The Datatype Standards Editor opens:

You define the datatype mapping standards by specifying how logical datatypes map to the available datatypes for your target server. If you have database applications running on multiple server platforms, you can map datatypes for all of the target servers. Datatype mapping information is saved in a datatype standards file (\*.dsm). For each model in which you use datatype standards, you must attach a datatype standards file. If you open a model and you have not attached a datatype standards file, the default datatype mapping is used.

## Create a Datatype Mapping List

You use the Insert New Mapping feature in the Datatype Standards editor to map a datatype from one target server to another. You also use this feature to add a new datatype.

### To create a datatype mapping list

1. In the Datatype Standards Editor, click Insert New Mapping on the Mapping menu.
2. Click the down arrow on the From list, and select the target server from which you want to map.

3. Click the down arrow on the To list and select a target server to which you want to map.

The From and To columns are populated with the default mappings for the selected target servers. Notice that the datatype row at the bottom of the list is blank.

4. Click in the blank cell at the bottom of the From list and enter a new datatype name.
5. Click the blank cell at the bottom of the To list and select the datatype that you want to assign from the drop-down list.

### Save a Datatype Mapping File (.dsm)

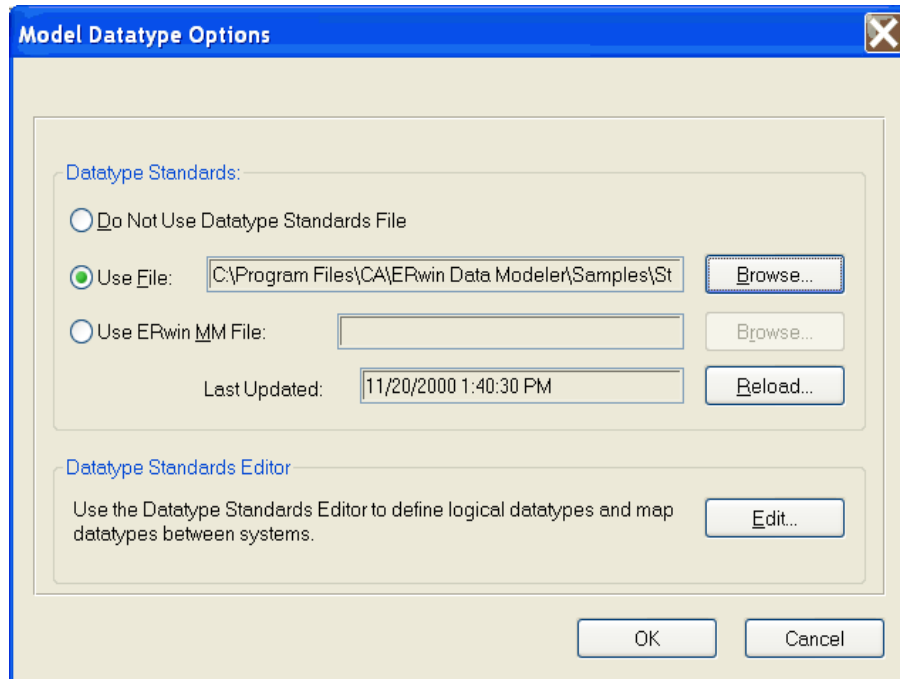
After you define the datatype standards, you need to save it in the Datatype Standards editor to attach it to models.

#### **To save a datatype mapping file (.dsm)**

1. From the File menu, choose Save.  
The Save As dialog opens.
2. Enter the file name, select DSM from the file type list, and click Save.  
The file is saved and the dialog closes.

## The Model Datatype Options Dialog

You can define your datatype mapping standards once and apply them to multiple data models. When you click Datatypes on the Tools menu and then click Model Datatype Options, you can specify the datatype mapping file that you want to apply to the current model.



## Attach a Datatype Standards File to a Model

To activate datatype mapping in your model, you open a data model and attach the datatype standards file to the model.

### To attach a datatype standards file to a model

1. Click Datatypes on the Tools menu, then click Model Datatype Options.

The Model Datatype Options dialog opens.

2. Click Use File, then click the Browse button to locate the file that you want to attach.

The Set Location dialog opens.

3. Select the file to attach, and click Set.

The Set Location dialog closes.

4. Click OK.

The editor closes and the datatype standards file is attached and applied to the current model and all models derived from the current model.

## Datatype Standards Reuse

After you define and save your datatype standards, you can reuse the files by attaching them to other models.

While it may take some time to establish and implement these standards across your enterprise, CA ERwin DM helps you take the initial steps and supports your ongoing efforts to maintain standards.

You can enforce consistency in all of your data models, databases, and applications.



# Appendix A: Third-Party Acknowledgements

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# Appendix B: Supported Metadata Integration Bridges

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## Table of Supported Bridges

The following table lists the Meta Integration Technology, Inc. (6.0.5) bridges that are currently available in CA ERwin DM (as of r7.3.8 SP2):

Application	Mode
Altova XMLSpy	Export
Borland Together (via UML 1.x XMI)	Export
Borland Together (via UML 2.x XMI)	Import
CA Component Modeler 3.52 (ParadigmPlus)	Import/Export
CA Component Modeler 4.x (via UML 1.x XMI)	Import/Export
CA Cool:Biz 5.1	Import
CA Cool:BusinessTeam (GroundWorks) 2.2.1	Import
CA Cool:DBA (Terrain for DB2) 5.3.2	Import
CA Cool:Enterprise (ADW) 2.7	Import
CA Cool:Xtras Mapper (TerrainMap for DB2)	Import
CA ERwin 3.x (ERX)	Import/Export
CA Gen 4.1a to 7.6	Import/Export
CA Repository for Distributed Systems	Import/Export
CA Repository for z/OS	Import/Export
Cobol Copybook Flat Files	Import
Composite Software Composite Studio (MIR XMI)	Export
Database data definition language (DDL)	Export
Embarcadero Describe (via UML 1.x XMI)	Import/Export
Embarcadero ER/Studio Business Architect(via DM1)	Import/Export
Embarcadero ER/Studio Data Architect	Import/Export
EMC ProActivity 3.x & 4.0	Import

<b>Application</b>	<b>Mode</b>
Gentleware Poseidon (via UML 1.x XMI)	Import/Export
Grandite Silverrun-RDM 2.4.4 to 2.7.2	Import
HP Knightsbridge CDMA	Export
IBM Cognos 8 BI Reporting - Framework Manager	Import/Export
IBM Cognos 8 BI Reporting - Framework Manager for ReportNet	Import/Export
IBM Cognos 8 BI Reporting - QueryStudio	Import
IBM Cognos 8 BI Reporting - ReportStudio	Import
IBM Cognos Series 7 Impromptu	Export
IBM DB2 Warehouse Manager (via CWM XMI)	Import/Export
IBM InfoSphere DataStage	Import/Export
IBM InfoSphere Warehouse / Cubing Services for OLAP	Import/Export
IBM InfoSphere Warehouse / InfoSphere Data Architect	Import/Export
IBM InfoSphere Data Architect	Import/Export
IBM Rational Rose 4.0	Import/Export
IBM Rational Rose 6.0 (98i) to 6.5 (2000)	Import/Export
IBM Rational Rose 7.x (2000e and newer)	Import/Export
IBM Rational Rose XDE Developer (Rose MDL)	Export
IBM Rational Software Architect (RSA) (Rose MDL)	Export
IBM Rational Software Architect (RSA) (via UML 2.x XMI)	Import
IBM Rational Software Modeler RSM (Rose MDL)	Export
IBM Rational System Architect 7.1 to 11.x (File)	Import/Export
IBM Rational System Architect 10.4 to 11.x (Encyclopedia)	Import/Export
IBM Telelogic Tau (via UML 1.x XMI)	Import/Export
Informatica Data Analyzer	Export
Informatica Developer - Beta bridge	Import/Export
Informatica Metadata Manager	Export
Informatica Metadata Manager (MIR XMI)	Export
Informatica PowerCenter	Export
Informatica PowerCenter (File)	Import
IRI CoSORT (RowGen) Data Definition File	Export

<b>Application</b>	<b>Mode</b>
IRI CoSORT (SortCL) Data Definition File	Export
Kalido DIW	Import
Meta Integration Repository (MIR) Transformations to Views XMI file	Export
Meta Integration Repository (MIR) XMI file	Import/Export
Meta Integration Repository (MIR) XMI multimodel content	Import/Export
Microsoft Office Excel	Import/Export
Microsoft Office Visio Database (ERX)	Import/Export
Microsoft Office Visio UML (UML XMI)	Import
Microsoft SQL Server Analysis Services (via DSV File)	Import/Export
Microsoft SQL Server Analysis Services 2005 to 2008 (File)	Import
Microsoft SQL Server Data Source View	Import/Export
Microsoft SQL Server Integration Services	Export
Microsoft SQL Server Integration Services (via DSV File)	Import/Export
Microsoft SQL Server Integration Services (Project)	Export
Microsoft SQL Server Integration Services (File)	Import
Microsoft SQL Server Reporting Services (File)	Import
Microsoft SQL Server Repository 2.1b (XIF)	Import/Export
Microsoft SQL Server Repository 3.x (MDC)	Import/Export
Microsoft SQL Server XML Data Reduced (XDR) Schema	Import
Microsoft Visual Studio/Modeler 2.0 (MDL)	Import/Export
NoMagic MagicDraw (via UML 1.x XMI)	Import/Export
OMG CWM 1.x XMI 1.x	Import/Export
OMG CWM Pre-1.0 XMI 1.1	Import/Export
OMG UML 1.x XMI 1.x	Import/Export
OMG UML 2.x XMI 2.x	Import
Open Text eDOCS Data Integration (Hummingbird) Genio	Import/Export
Oracle Business Intelligence Answers	Import
Oracle Business Intelligence Enterprise Edition	Import
Oracle Business Intelligence Server	Import
Oracle Data Integrator	Import/Export

Application	Mode
Oracle Designer	Import/Export
Oracle Hyperion Application Builder (via CWM XMI)	Import/Export
Oracle Hyperion Essbase Integration Services	Import/Export
Oracle Warehouse Builder	Import/Export
Oracle Warehouse Builder (via CWM XMI)	Import/Export
SAP BusinessObjects Crystal Reports XI (File)	Import
SAP BusinessObjects Data Integrator	Import/Export
SAP BusinessObjects Designer (File)	Import/Export
SAP BusinessObjects Desktop Intelligence (File)	Import
SAP BusinessObjects Metadata Manager (via MIR XMI)	Export
SAP NetWeaver Master Data Management (MDM)	Import/Export
SAS Data Integration Studio (via CWM XMI)	Import/Export
SAS Data Integration Studio (via MIR XMI)	Import/Export
SAS Information Map Studio (via MIR XMI)	Import/Export
SAS Management Console (via MIR XMI)	Import/Export
SAS Metadata Management (via MIR XMI)	Import
Select SE	Import
Sparx Enterprise Architect (EA) (via UML 1.x XMI)	Import/Export
Sparx Enterprise Architect (EA) (via UML 2.x XMI)	Import
Sybase PowerDesigner 7.0 (ERX)	Export
Sybase PowerDesigner CDM 6.x	Import
Sybase PowerDesigner CDM 7.5 to 15.x	Import
Sybase PowerDesigner CDM 8.0 to 15.x	Export
Sybase PowerDesigner OOM 9.x to 15.x (via UML 1.x XMI)	Import/Export
Sybase PowerDesigner PDM 6.1.x	Import
Sybase PowerDesigner PDM 7.5 to 15.x	Import
Sybase PowerDesigner PDM 8.x to 15.x	Export
Sybase PowerDesigner XSM 10.x to 15.x	Export
Tigris ArgoUML (via UML 1.x XMI)	Import/Export
Visible IE:Advantage 6.1	Import



<b>Application</b>	<b>Mode</b>
W3C XML DTD 1.0	Import
W3C XML Schema 1.0 (XSD)	Import/Export

For information on how to use the metadata integration wizards, see the CA ERwin DM online help.



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