SERENA

SERENA®
DIMENSIONS® RM 2010 R1

Administrator's Guide

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Preface

Objective

The purpose of this manual is to describe how to configure, manage, and administer Serena® Dimensions® RM projects, users, and groups. Dimensions RM is a comprehensive requirements management application that lets development teams capture, engineer, and manage requirements through the entire product life cycle.

Edition Status

The information in this manual applies to *Release 2010 R1 of Serena®* Dimensions® RM. This edition supersedes earlier editions of this manual.

IMPORTANT! The 64-bit Windows Oracle 11gR2 Serena-Supplied Runtime RDBMS referred to throughout this guide will be released shortly after the earliest release of Dimensions RM 2010 R1. If you plan to use this RDBMS, please check for its availability on the Serena Support download site or contact Serena Support regarding its planned release date.

`dbDoctor` utility

The `dbdoctor` database test and repair utility, which was documented in previous editions of this guide, is now only available directly from Serena Support. If Serena Support provide you with this utility, you must only use it under their supervision.

Audience

This manual is intended for Dimensions RM administrators responsible for creating and managing projects, users, and groups.

Related Documents

Title	Description
Serena® Dimensions® RM Installation Guide	Guide to installing the current version of Dimensions RM or upgrading an earlier installed version.

Title	Description
Installing the Serena-Supplied Runtime RDBMS	Guide to installing: ▪ The Windows 32-bit or 64-bit Serena-Supplied Runtime RDBMS. The 32-bit version is based on Oracle 10g; whereas, the 64-bit version is based on Oracle 11gR2. ▪ The UNIX 32-bit Serena-Supplied Runtime RDBMS is based on Oracle 10g. For Dimensions RM, this is only applicable to an RDBMS installation on a remote network node.
Installing the Serena License Manager	Guide to installing: ▪ The Windows 32-bit Serena License Manager (SLM). ▪ The UNIX 32-bit SLM. For Dimensions RM, this is only applicable to an SLM installation on a remote network node.
Serena® Dimensions® RM User's Guide	Guide to using Dimensions RM to create, manage, and track requirements during the lifecycle of a project.
Serena® Dimensions® RM Integration Guide for Serena® Business Manager	Guide to integrating Dimensions RM and Serena Business Manager (SBM).
Serena® Dimensions® RM Integration Guide for IBM® Rational® Software Modeler	Guide to integrating Dimensions RM and Rational Software Modeler (RSM).
Serena® Dimensions® RM Synchronization Engine User's Guider	Guide to integrating Dimensions RM and other tools (for example, HP Quality Center) using the Synchronization Engine.

E-Learning Tutorials

E-Learning tutorials for Dimensions RM can be accessed at the following public Web site:

http://www.serena.com/serenacourseware/dimensionsrm/import

Typographical Conventions

The following typographical conventions are used in the online manuals and online help. These typographical conventions are used to assist you when using the documentation; they are not meant to contradict or change any standard use of typographical conventions in the various product components or the host operating system.

italics	Introduces new terms that you may not be familiar with and occasionally indicates emphasis.
bold	Emphasizes important information and field names.
UPPERCASE	Indicates keys or key combinations that you can use. For example, press the ENTER key.
`monospace`	Indicates syntax examples, values that you specify, or results that you receive.
`monospaced italics`	Indicates names that are placeholders for values you specify; for example, *`filename`*.
`monospace bold`	Indicates the results of an executed command.
vertical rule |	Separates menus and their associated commands. For example, select File | Copy means to select Copy from the File menu. Also, indicates mutually exclusive choices in a command syntax line.
brackets []	Indicates optional items. For example, in the following statement: `SELECT [DISTINCT]`, DISTINCT is an optional keyword.
. . .	Indicates command arguments that can have more than one value.

Printing Manuals

As part of your Dimensions license agreement, you may print and distribute as many copies of the Dimensions manuals as needed *for your internal use, so long as you maintain all copies in strict confidence and take all reasonable steps necessary to ensure that the manuals are not made available or disclosed to anyone who is not authorized to access Dimensions under your Dimensions license agreement*.

Contacting Technical Support

intersolv provides technical support for all registered users of this product, including limited installation support for the first 30 days. If you need support after that time, contact Serena Support at the following URL and follow the instructions:

http://www.serena.com/support/

Language-specific technical support is available during local business hours. For all other hours, technical support is provided in English.

The Serena Support web page can also be used to:

- Report problems and ask questions.
- Obtain up-to-date technical support information, including that shared by our customers via the Web, automatic e-mail notification, newsgroups, and regional user groups.
- Access a knowledge base, which contains how-to information and allows you to search on keywords for technical bulletins.
- Download fix releases for your Serena products.

Chapter 1

Dimensions RM Overview

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What is Dimensions RM?

Serena® Dimensions® RM is the Serena Software solution for requirements management. Dimensions RM delivers an enterprise-wide solution based on an Oracle® RDBMS (either a Serena-Supplied Runtime version or your own company's Oracle). Dimensions RM makes it easy for you to capture and organize requirements data by providing the tools you need to create, manage, and track such data throughout a project's lifecycle.

What is Requirements Management?

Requirements management is the process by which an engineering project records and maintains the official, binding description of what it plans to achieve.

The requirements management process includes the following activities:

- Requirement development.
- Reporting and traceability.
- Change management.
- Communication

Requirement Development

One of the first steps in every project is the specification of requirements. Tracking these requirements across different organizations and understanding the impact that various requirements have on cost, schedule, and time-to-market can have a dramatic effect on project success.

Dimensions RM stores requirements in a database. The requirements for a project can come from various sources, such as customers, management, Marketing, Quality Assurance (QA), Support, and field personnel. The requirements can be entered directly into Dimensions RM, or imported from a Microsoft® Word document, plain text document, comma separated value (CSV) file, or XML document (.xml) file. You synchronize Word documents or text documents with the database as requirements evolve.

You can also import requirements from other tools, such as Serena® Business Manager (formerly known as Serena® Business Mashups and TeamTrack), IBM® Rational® Software Modeler, HP Quality Center, and Microsoft® Project. For more information about the integration of Dimensions RM with these products, see the guides listed in the "Related Documents" on page 11.

Reporting and Traceability

With traceability, users can evaluate the effects of changes in requirements and identify potential problems. Traceability involves making explicit links between requirements and other entities.

For example, suppose you link marketing requirements to test cases. You then run a report on this relationship. The report shows marketing requirements on the left side of the report, and any associated test cases on the right side of the report. This format

allows you to easily determine which marketing requirements lack associated test cases. Another type of traceability report you can create in RM Browser shows the requirements in the relationship in a tree-like structure.

Change Management

Requirements change over time. The change management activity within a requirements management process involves preventing unauthorized changes, gathering the information necessary to make informed decisions about which changes to allow, and making those changes in a systematic way.

In Dimensions RM, you can submit a change request against a specific requirement. If a user has the appropriate permissions, he or she can accept or reject the change request.

Communication

Dimensions RM provides several ways to facilitate communication among team members.

- **Comments**—You can participate in discussion threads by adding comments to requirements. This functionality allows you to communicate issues and discuss their resolution without directly changing the requirement.

  For information about adding comments in RM Browser, see the *Serena Dimensions RM Browser User's Guide*.

- **Polls**—Users with the appropriate permissions can start a poll on a requirement. The poll typically either solicits feedback on its content or asks whether a change request against the requirement should be accepted or rejected. If the e-mail service is running, and the user accounts include e-mail addresses, the poll participants receive an e-mail message that notifies them about the poll and provides a direct link to the RM Browser page from which they vote. For more information on polling, see the *Serena Dimensions RM Browser User's Guide*.

- **E-Mail Notification**—Users or administrators can set up rules that specify that an e-mail notification be sent when a particular event occurs. For example, you could set up a rule that causes an e-mail notification to be sent to you when any requirement you created changes. For more information on e-mail notification, see the *Serena Dimensions RM Windows Clients User's Guide*.

Dimensions RM Tools

The following sections briefly describe the Dimensions RM tools. The Dimensions RM tools are the various interfaces you use to perform specific tasks.

RM Browser

RM Browser is the primary user interface. It provides Web access to a core set of Dimensions RM functions. Using RM Browser, both remote and local users can use a Web browser to edit requirements, submit and review change requests, run reports, create filters and scripts, participate in discussions, run polls, create containers (baselines, collections, documents, or snapshots), manage categories, associate containers to Dimensions CM projects, and so on. RM Browser requires no installation.

RM Explorer

NOTE RM Browser provides the functionality that RM Explorer provides. RM Browser is the preferred tool to use.

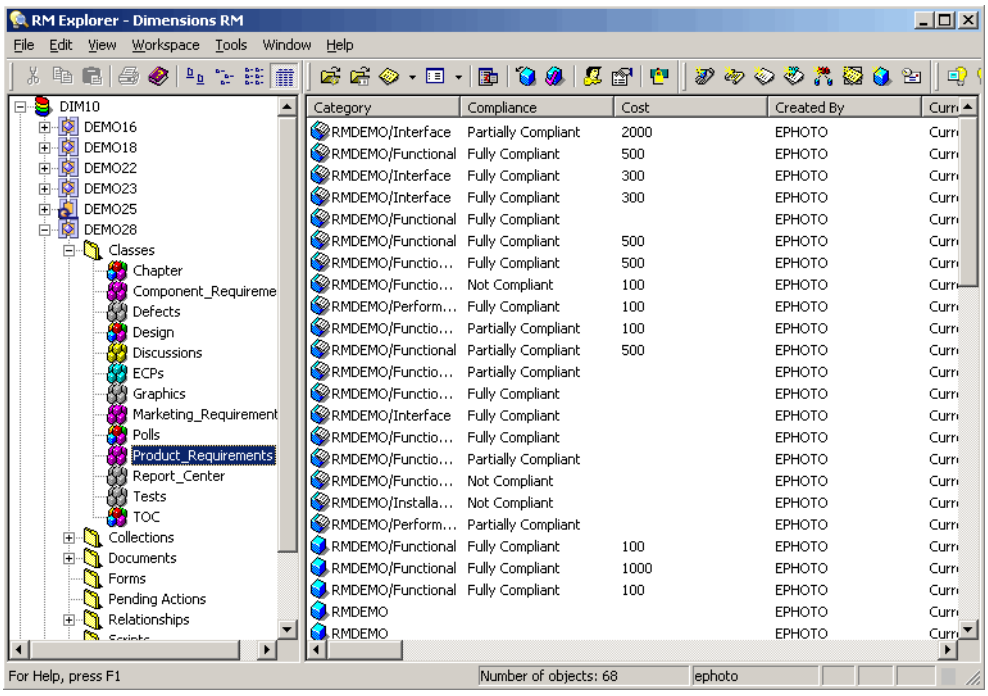


Figure 1-1. RM Explorer

RM Explorer provides an integrated Windows® Explorer-like view of a project, so you can see and organize an entire project at once, not just one element at a time. RM Explorer provides a single interface for launching other Dimensions RM tools. You do not have to log in to the other tools from RM Explorer; however, if you launch certain tools from outside of RM Explorer, you have to log in to each one individually.

You can use RM Explorer to manage and organize all the elements and source files of your requirements project. RM Explorer lets you see the hierarchy of classes, containers

(baselines, collections, documents, files, or snapshots) and folders in your project. You can import and update data with RM Explorer, and view the attributes of all the components of your project. You can also use RM Explorer to create custom views and filters.

For detailed information about using RM Explorer, see the *Serena Dimensions RM Windows Clients User's Guide*.

RM Concept

NOTE RM Browser provides the functionality that RM Concept provides. RM Browser is the preferred tool to use.

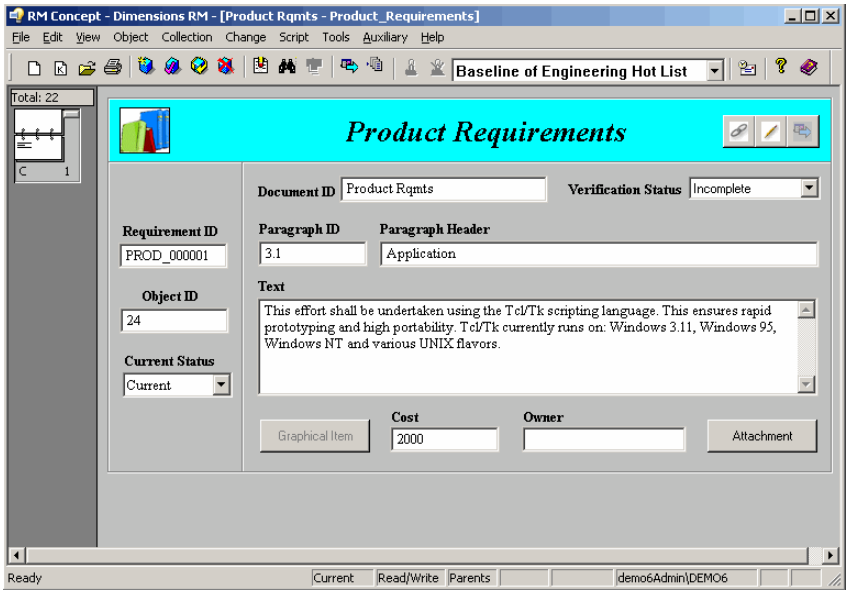


Figure 1-2. RM Concept

RM Concept tracks the requirements engineering and change processes. With RM Concept, you can capture requirements both manually and automatically. You can also customize views for reporting and information gathering.

To support change management, RM Concept manages requirements, reports changes, generates customized reports, and compares versions. Multiple instances of RM Concept can be run simultaneously. RM Concept provides locking at the data level.

For detailed information about using RM Concept, see the *Serena Dimensions RM Windows Clients User's Guide*.

RM Word

NOTE RM Import is a replacement for RM Word.

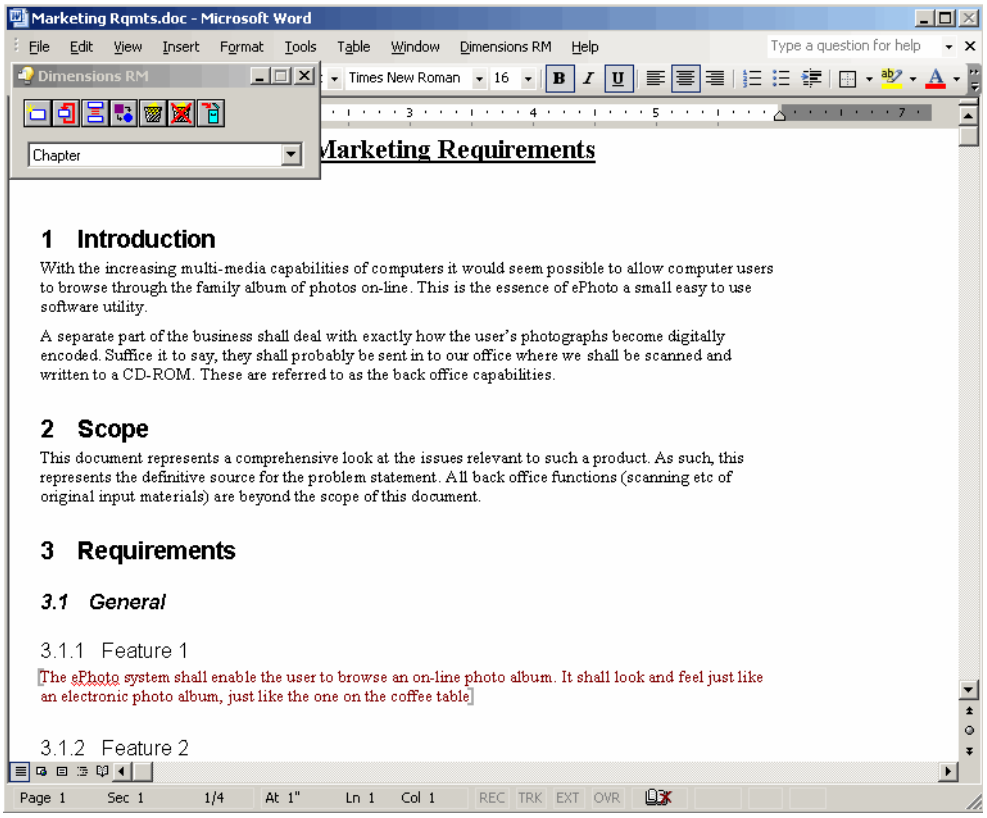


Figure 1-3. RM Word

RM Word allows you to capture, delete, and edit data directly from Microsoft® Word. With RM Word, you can register documents in the database and synchronize requirements in a document with requirements in the database. After you have captured data from Word into the database as requirements, you can use RM Browser or RM Concept to modify the requirements.

For detailed information about using RM Word, see the *Serena Dimensions RM Windows Clients User's Guide*.

RM Capture

RM Capture allows you to capture requirements from plain text documents.

For detailed information about using RM Capture, see the *Serena Dimensions RM Windows Clients User's Guide*.

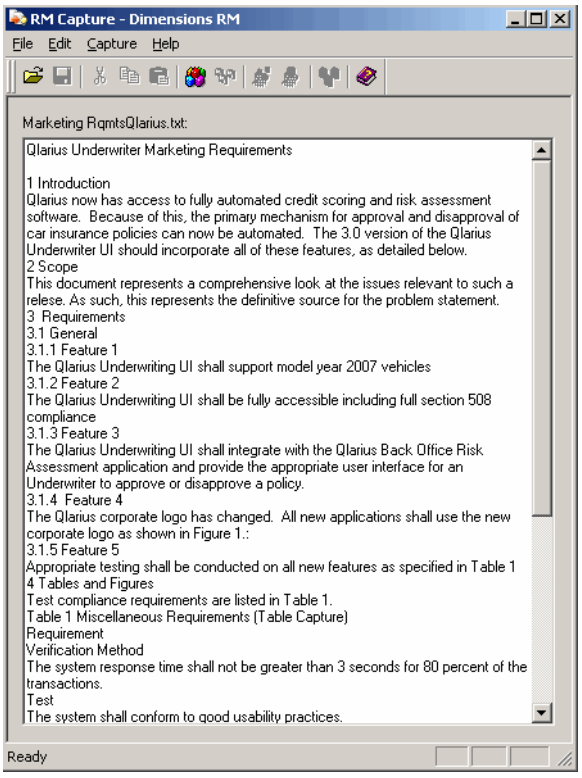


Figure 1-4. RM Capture

RM Import

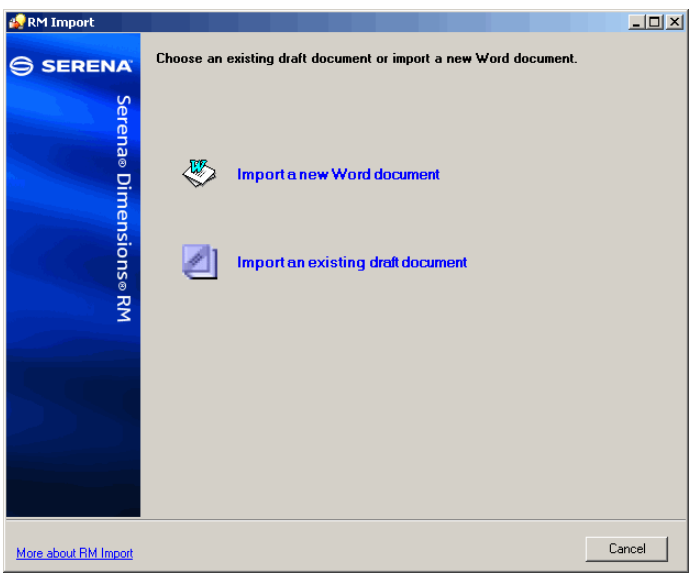


Figure 1-5. RM Import

RM Import allows users to preview a Word document as a draft document, change the description of chapters, reorganize the chapters, change the values of attributes, move attributes between chapters, and so on. When satisfied with the draft document, users

can import the document into Dimensions RM as a document. For detailed information about using RM Import, see the *Serena Dimensions RM Windows Clients User's Guide*.

RM Import Designer

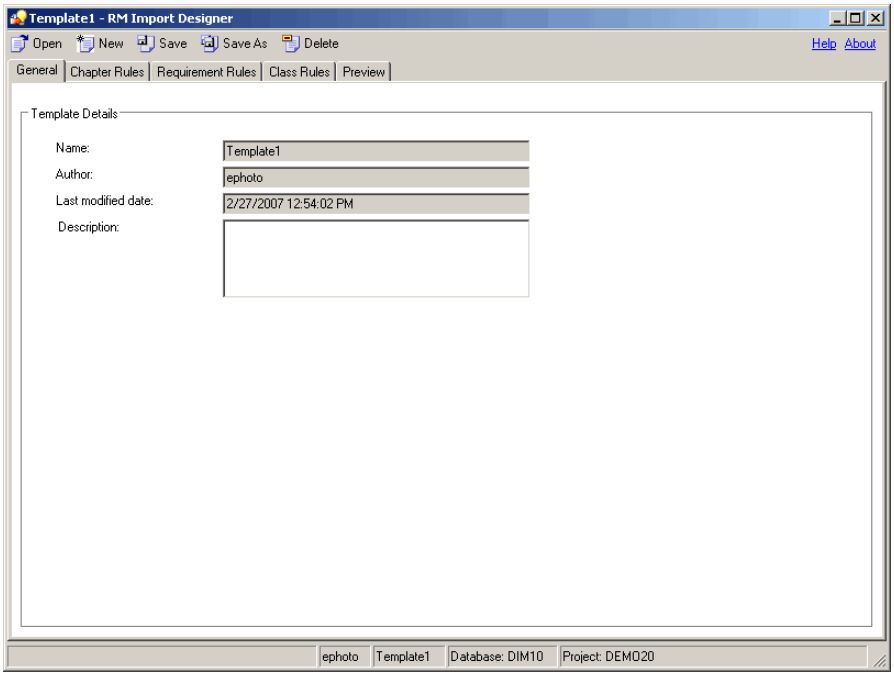


Figure 1-6. RM Import Designer

RM Import Designer allows administrators to design templates that users select when importing Word documents using RM Import. Templates define how to identify classes, attributes, chapters, requirements, and categories. Templates can be saved to the database for future use. Administrators who develop templates must be knowledgeable about class types and the structure of the Word documents that will be imported. For detailed information about using RM Import Designer, see Chapter 4, "RM Import Designer" on page 167.

RM Manage

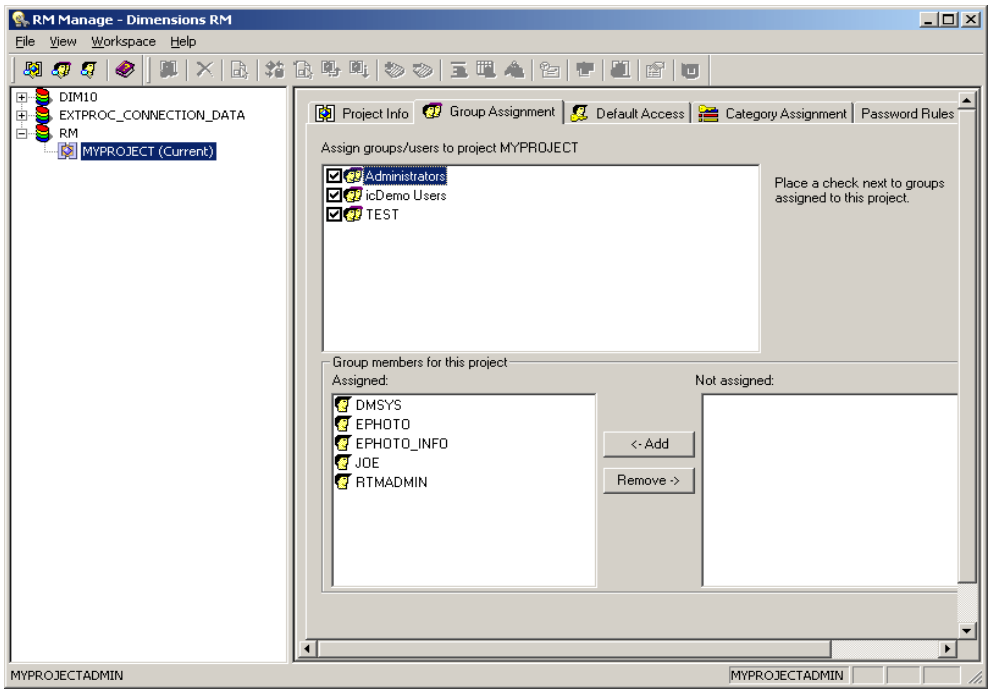


Figure 1-7. RM Manage

RM Manage allows project administrators to define users and groups, administer project security, configure the project database, organize data, and control user access and data routing. For detailed information about using RM Manage, see Chapter 2, "RM Manage" on page 39.

Class Definition

Class Definition allows project administrators to set up project schemas in class definition diagrams. This involves defining classes, relationships, attributes, and security. For detailed information about using Class Definition, see Chapter 3, "Class Definition" on page 115.

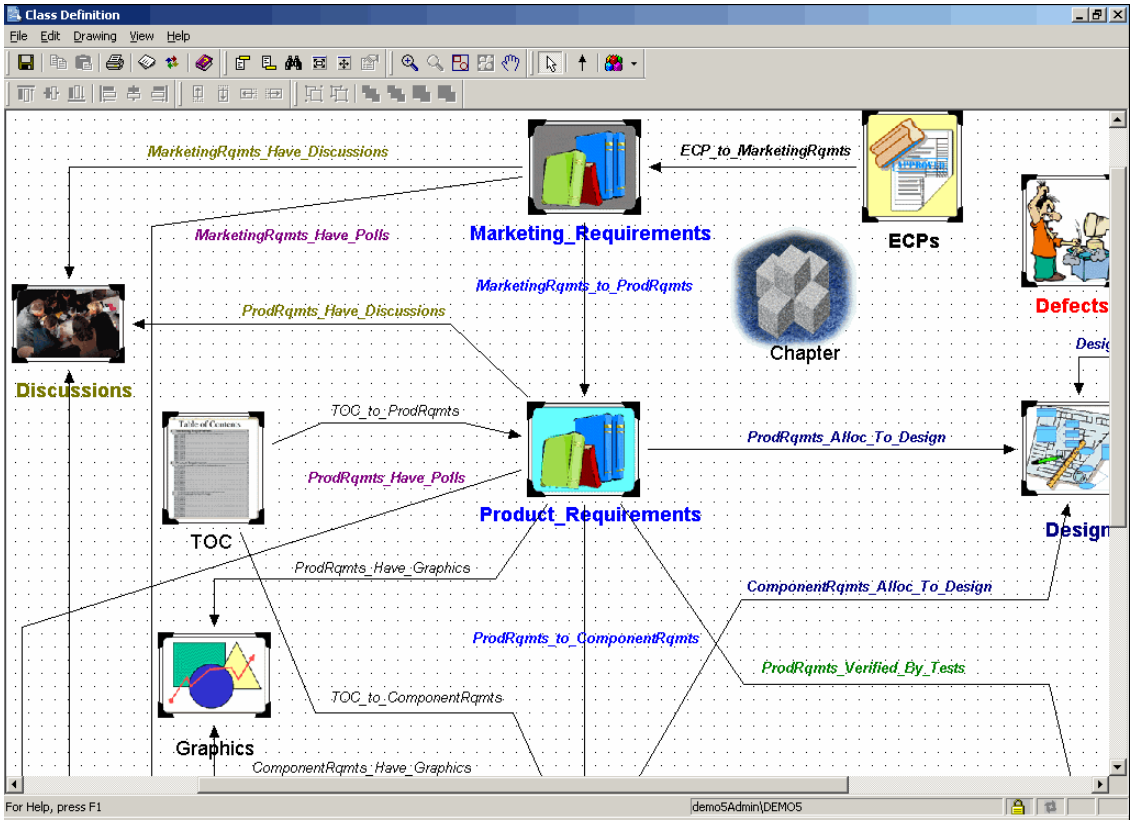


Figure 1-8. Class Definition

Dimensions RM Data Structure

The following diagram illustrates the Dimensions RM data structure.

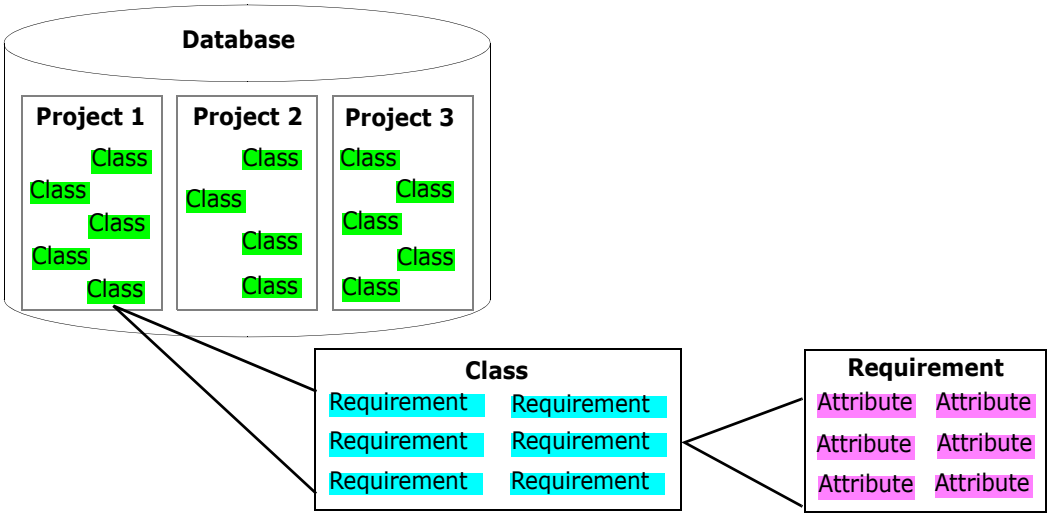


Figure 1-9. Dimensions RM Data Structure

The resources in the data structure are explained in detail later in this chapter. For purposes of illustration, however, consider the example in the following table.

Resource	Value
Project 1	RELEASE1
Class	Customer_Requirements
Requirement	CUST_000007
Attributes	Rqmt ID = *CUST_000007* Document ID = *Customer Requirements* Rollout Plan = *First Release* Priority = *Priority 1* Object ID = *7* Paragraph ID = *3.1.6* Paragraph Title = *Configuration* Current Status = *Current* Text = *All preferences shall be remembered between invocations.*

Dimensions RM Basics

This section provides an overview of basic Dimensions RM concepts.

Projects and Databases

Dimensions RM "projects" are the containers of related requirements and other engineering data along with the Dimensions RM customizations (forms, scripts, and so on) that users create to manipulate that data. The project is the main focus of activity within Dimensions RM. Dimensions RM stores projects in an Oracle database (that database being in either the Serena-Supplied Runtime RDBMS or your own company's Oracle RDBMS). A project in Dimensions RM typically corresponds to an actual project (for example, a product).

NOTE If you want to share requirements among projects, use categories to represent projects. For more information about categories, see "Categories" on page 28.

As a Dimensions RM user, you can access any number of projects and databases from the Dimensions RM tools. Each project uses a single Oracle user account.

Administrators use the RM Manage tool to create and maintain projects. For information about RM Manage, see Chapter 2, "RM Manage" on page 39.

Users and Groups

Users and groups are defined within each Dimensions RM database and are associated with specific projects in the database.

Each Dimensions RM user has a password-protected account within Dimensions RM that identifies the user. The account stores information such as the user's first and last names, and e-mail address. The user name is associated with the modifications made to the project while the user is logged in to the account.

NOTE Dimensions RM user accounts are distinct from operating system user accounts and Oracle user accounts.

While access to project elements can be controlled on a single-user basis, Dimensions RM users are typically organized into groups that can share access privileges. Individual users can be associated with any number of projects through their group memberships. Dimensions RM user groups usually match organizational groups or roles such as Managers, Developers, QA Engineers, and System Engineers. Members of a pre-defined Administrators group can add additional members to the group.

Each Dimensions RM project has a special user account, the project administrator. The project administrator is automatically and irrevocably granted privileges that allow him or her to manage the project. Other users can be given administrative privileges at the discretion of the project administrator. The project administrator uses the RM Manage tool to create and manage users and groups. For information about using the RM Manage tool, see Chapter 2, "RM Manage" on page 39.

NOTE The project administrator is not part of the Administrators group.

Project Schemas

Each Dimensions RM project has its own schema that defines the kinds of information to be managed in the project. A schema contains a number of class and relationship definitions. Class definitions must be in place to create requirements, and relationship definitions must be in place to create links between requirements.

The project schema does not have to be completely defined before useful work can be accomplished; you only need the classes and relationships that you will use now. As the project evolves, other classes and relationships can be added and existing classes can be changed.

Schemas are created in a class definition diagram through the Class Definition tool. For an illustration of a class definition diagram, see "Class Definition" on page 23. For information about using Class Definition, see Chapter 3, "Class Definition" on page 115.

Classes and Requirements

Dimensions RM classes are used to define and control the information types to be managed within a project. Typically, Dimensions RM classes correspond to the work products of the engineering processes that are to be supported. Common examples of classes include Marketing_ Requirements, Customer_Requirements, Security_Requirements, Software_Requirements, Hardware_Requirements, Action_Items, Test_Cases, and Engineering_Change_Proposals.

NOTE Words in class names must be connected with underscores.

Dimensions RM predefines many classes to be used as templates for class definitions. You can also build your own classes. In class definition diagrams, a class is represented by an icon.

A requirement is an instance of a class.

Relationships and Links

Dimensions RM relationships define the associations between classes. For example, you can create a relationship between the Customer_Requirement and Test_Cases classes that enables you to link a test case to the customer requirements that it fulfills.

Relationships between classes enable the following functions:

- Generating reports containing data from multiple classes.
- Checking completeness of data.
- Building database subsets.
- Assessing impact analysis through traceability.

A *link* (for example, an association between a specific customer requirement and a specific test case) is an instance of a relationship. You can link two requirements together if a relationship between their corresponding classes is defined.

In class definition diagrams, a relationship is represented by an arrow connecting two classes. Relationships are directional, where a *primary* class points to a *secondary* class. This distinction is important when navigating and reporting on links between requirements. You can follow a link in either direction, but in many cases, you must know which class is primary and which class is secondary to create effective reports.

NOTE Words in relationship names must be connected with underscores.

Attributes

Classes and relationships represent logical groupings of information. Each class definition and each relationship definition includes its name and its attributes. Attributes characterize the class or relationship in terms of its properties. For example, a Customer_Requirements class could have attributes for a title, a rationale, a textual statement of the requirement, and a priority.

Dimensions RM supplies a core set of *implicit* attributes for each class and relationship. Dimensions RM uses implicit attributes to maintain the integrity of project information. Implicit attributes include intrinsic information such as the project unique identifiers (PUIDs), object IDs, and modification times. You cannot modify implicit attributes; however you can modify their display names.

You can create *user-defined* attributes for use in a specific class. Dimensions RM provides the following attribute types from which to create user-defined attributes:

Attribute Type	Description
Action	Launches another application when the user clicks a button on the form view of an requirement in RM Concept. For example, the action attribute could be defined to open a Microsoft® Excel® spreadsheet. **NOTE:** Action attributes are not supported by RM Browser.
Alphanumeric	Represents one line of alphanumeric text, such as the title of an acceptance test. It can be up to 1000 characters in length.

Attribute Type	Description
Date	Stores values that are based on user-defined date formats (for example, DDMMYY, YYYYMMDD, and so on). A date attribute, for example, could be used for dates in which test cases are performed.
File Attachment	Holds a single file that can be accessed through RM Browser. For example, you could add the file attachment attributes *Use Cases*, *Customer Letter*, and *Business Justification* to the Marketing Requirements class. You can then use RM Browser to add the applicable file for each attribute. Users can then view the file or download it to their computers. File attachments can also be included as links in Word documents published from Document View. The links are displayed as icons. You can double-click the icon in the published document to open the associated file.
Graphic	Holds either graphic images or OLE data captured from RM Word.
List	Provides a list of values from which users make a selection. For example, you could list *Pass*, *Fail*, and *Untested* as valid values for a list attribute named test_result.
Numeric	Holds numeric values, such as reference numbers. The numbers can include decimal points.
Text	Holds up to 64 KB of plain text or HTML text that can span more than one line. It is suitable for long descriptions, such as the description of an acceptance test. In RM Browser, when you click in or tab to a text attribute, an HTML editor opens. The HTML editor provides many common features of word processors.

When you create a user-defined attribute, you can also specify additional properties such as constraints on possible values, and whether an attribute value is mandatory. You can provide a default value to be used for a mandatory attribute when an actual value is not yet available.

Security

Access rights are associated with each resource defined in a Dimensions RM database. Access rights determine if you can perform a task on a target resource.

The project administrator uses the Class Definition tool to grant or deny access to resources defined in the project schema. This includes all classes, relationships, attributes, and source documents. The list of valid transactions for each of these different resources varies. If the project administrator does not grant or deny access to a specific resource in Class Definition, the default access defined in RM Manage for the resource category is used.

Categories

Categories provide a way to organize and access requirements, scripts, and filters. You can use categories to restrict access to requirements, scripts, and filters to a group of users. You can also use categories to organize and access projects and sub-projects. After you grant a user access to a category through group membership, the privileges available to the individual user or to the group through which you granted the user access are applied.

Categories are represented by a hierarchical structure inside a Dimensions RM project. Each node of the hierarchy can have different permissions settings for groups of users. All nodes in the hierarchy share the same schema. The category structure is displayed in RM Browser in the category tree pane of Requirement View, in the Customize Home page, and in query dialogs. For more information about RM Browser, see the *Serena Dimensions RM Browser User's Guide*. An example of a category tree pane in Requirements View is shown in the following illustration.

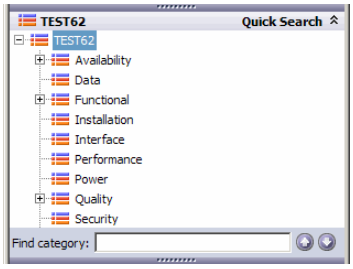


Figure 1-10. Category Tree Pane

A requirement can belong to only one category. In RM Browser, you can move a requirement from one category to another. The category to which a requirement belongs can be viewed in the **Edit Attributes** dialog, in other areas of RM Browser, and in other Dimensions RM tools. Categories can have subcategories, but each category can be a child of only one category. Each category can have requirements from all classes. The default root category has the same name as the project.

An administrator assigns group permissions to categories in RM Manage, and can add, delete, and rename categories in RM Browser. For more information about performing these tasks, see Chapter 2, "RM Manage" on page 39.

Requirement Creation

You can use the following methods to create requirements:

- Capture requirements from documents

  You can capture requirements from source documents that you register with Dimensions RM. Dimensions RM works with Microsoft Word (using RM Import or RM Word), plain text documents (using RM Capture), and comma separated value (CSV) files (using the CSV Import wizard).

  For documents captured through RM Word, Dimensions RM retains the linkage between the requirements captured in the project and their original locations in the source document. This linkage allows Dimensions RM to maintain synchronization between the document and the captured documents stored in the project. Each time you open the source document through RM Word, Dimensions RM prompts you to synchronize the document with the project. Differences between the project and the document version of each captured item are highlighted and presented to be reconciled.

- Enter requirements directly into Dimensions RM using a Dimensions RM tool, such as RM Browser or RM Concept.

- Import requirements from another tool such as Serena® Business Manager (formerly known as Serena® Business Mashups and TeamTrack), IBM® Rational® Software Modeler, HP Quality Center, Microsoft® Project, and Microsoft® Excel®.

NOTE For information about the integrations between Dimensions RM and other tools, see the integration guides listed in the "Related Documents" on page 11.

Requirement Evolution

As you evolve requirements within Dimensions RM, their history is retained so that you can trace the evolution of a requirement from its creation through to the current version. There is an implicit parent-child link between successive versions of a requirement.

Audit Trail

As you evolve requirements within your project, Dimensions RM retains the various versions of your requirements. This historical trace, known as the *audit trail*, allows you to reconstruct requirement evolution when needed (for example, to evaluate progress over time). At each stage of the evolution, you can record a rationale for changes, thus retaining project knowledge as well as the physical changes.

Current Status

A special implicit attribute, Current Status, identifies the state of the requirement. The Current Status values are described in the following table.

Current Status	Description
Current	The requirement is the most recent or current version.
Replaced	The requirement has been replaced by a newer version.
Proposed	A change request has been made to either change the current requirement or create a new requirement.
Accepted	A change request was accepted.
Rejected	A change request was rejected.
Deleted	The Current Status of the requirement is changed to Deleted, but the requirement remains in the project. The prior version of the requirement, if any, is given a current status of Current.

Operations on Requirements

There are two commands for saving changes you made to a requirement:

- **Update**—The Update command changes the content of the requirement as you specify, leaving all other attributes, including Current Status, intact. Update is often best reserved for minor changes such as correcting typographical errors. Because the requirement is not versioned with the Update command, it is highly recommended that only project administrators have permission to perform updates.
- **Replace**—The Replace command creates a new version of the requirement with the changes you made. With Replace, the Current Status of the original requirement is changed from Current to Replaced, a parent-child link is created from the original requirement to the new requirement, and the Current Status of the new requirement is set to Current.

- **Copy**—The Copy command creates a new requirement with the same attribute values as another requirement. You specify the attributes to be copied in Class Definition. For more information, see "Attributes" on page 126.

There are three commands that allow you to correct mistakes or undo changes you made:

- **Delete**—The Delete command changes the Current Status of a requirement to Deleted, but leaves the requirement in the project.
- **Undelete**—The Undelete command changes a Deleted requirement back to a Current requirement.
- **Remove**—The Remove command physically removes the requirement from the project. Only requirements with the Current status can be removed. It is highly recommended that only project administrators have permission to remove requirements.

When someone submits a change request to change a current requirement or create a new requirement, a copy of the current requirement is created with the current status of Proposed. There are two commands that can be used on a Proposed requirement:

- **Accept**—The Accept command accepts a proposed change. The current status of the proposed requirement becomes Accepted, and a copy of that requirement is created with the current status of Current.
- **Reject**—The Reject command rejects a proposed change. The current status of the proposed requirement becomes Rejected.

Requirement Lifecycle

The requirement lifecycle is shown in the following illustration.

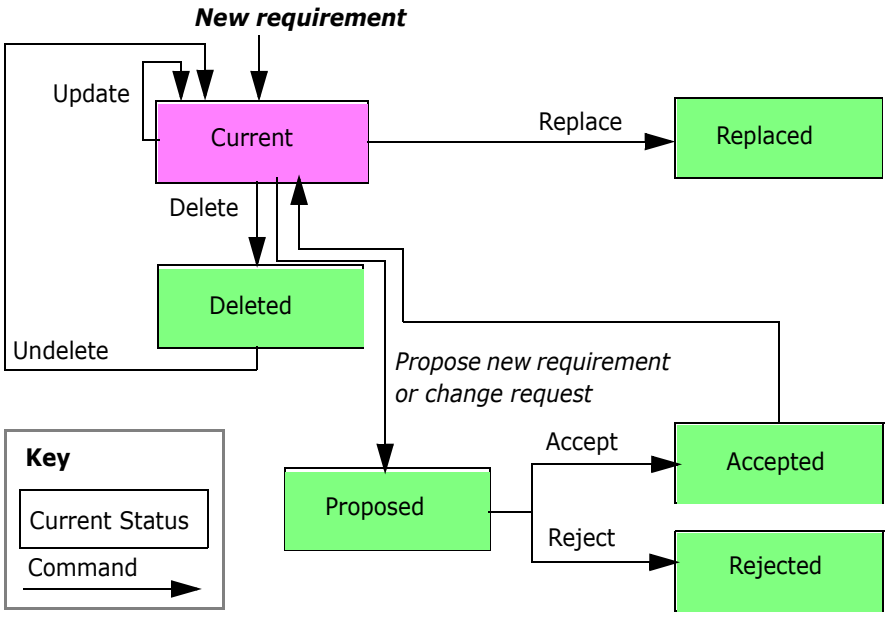


Figure 1-11. Object Lifecycle

Requirement Views

You can view data in a source document from its native tool (for example, Microsoft Word). There are five other ways to view objects in Dimensions RM:

- Form view
- Grid view
- Paragraph layout
- Grid layout

Form View

The form view displays one object at a time. From the form view in RM Browser and RM Concept, you can edit object attributes. From the form view of RM Concept, you can also find objects. The form view in RM Browser is available from the Requirements View.

Dimensions RM generates a default form for each class based on its attribute definitions. In RM Concept, you can build user-defined forms by customizing the system-generated form with the simple drag-and-drop editor.

The following illustration shows the form view in RM Browser.

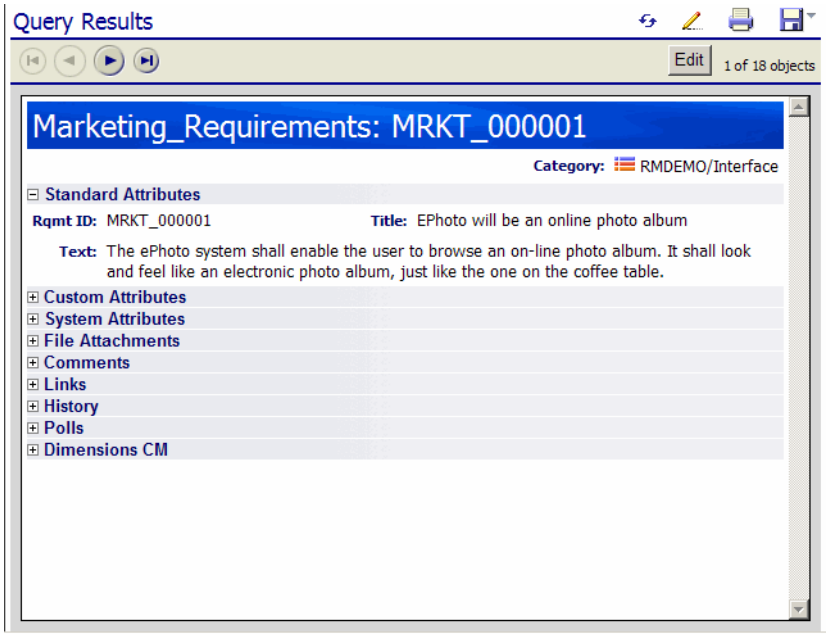


Figure 1-12. Form View in RM Browser

In RM Concept, Dimensions RM generates a form for each relationship based on the default class forms of the primary and secondary class. The forms are displayed in a split workspace. In the following illustration, Marketing_Requirements is the primary class, and Product_Requirements is the secondary class.

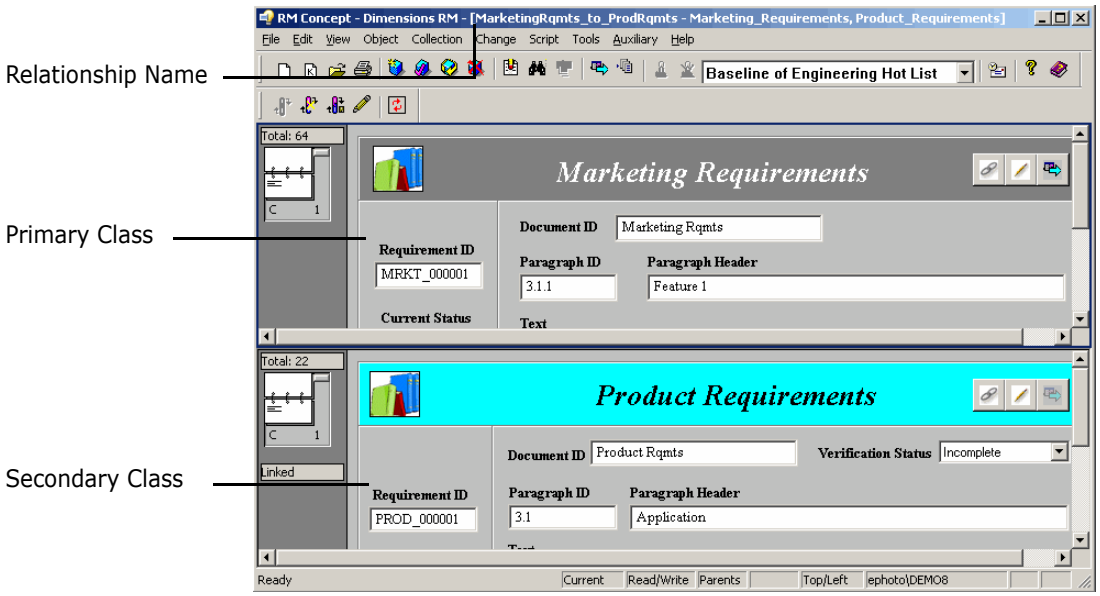
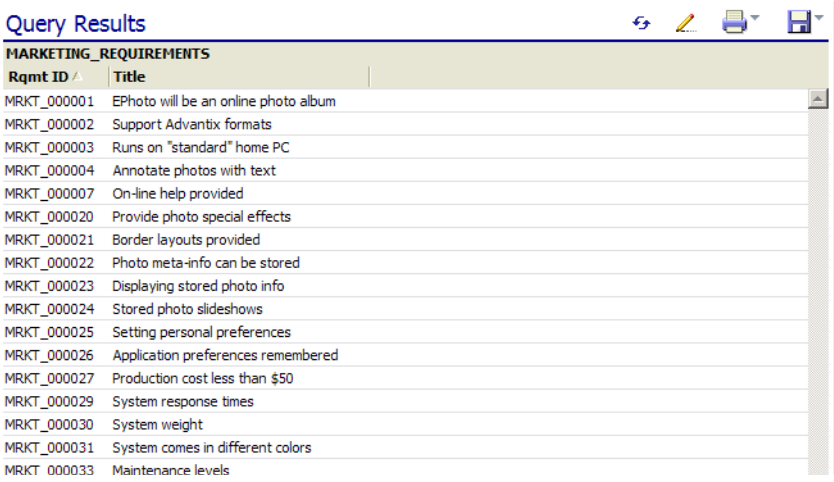


Figure 1-13. Form View of a Relationship in RM Concept

Grid View

The grid view displays multiple objects in a table-like list. The column headings represent attributes of the object. The rows contain the data stored in the attributes. The following illustration shows the grid view in RM Browser.



Query Results

MARKETING_REQUIREMENTS

Rqmt ID	Title
MRKT_000001	EPhoto will be an online photo album
MRKT_000002	Support Advantix formats
MRKT_000003	Runs on "standard" home PC
MRKT_000004	Annotate photos with text
MRKT_000007	On-line help provided
MRKT_000020	Provide photo special effects
MRKT_000021	Border layouts provided
MRKT_000022	Photo meta-info can be stored
MRKT_000023	Displaying stored photo info
MRKT_000024	Stored photo slideshows
MRKT_000025	Setting personal preferences
MRKT_000026	Application preferences remembered
MRKT_000027	Production cost less than $50
MRKT_000029	System response times
MRKT_000030	System weight
MRKT_000031	System comes in different colors
MRKT_000033	Maintenance levels

Figure 1-14. Grid View in RM Browser

Paragraph Layout

The paragraph layout in the Document View of RM Browser displays requirements as paragraphs in a list.

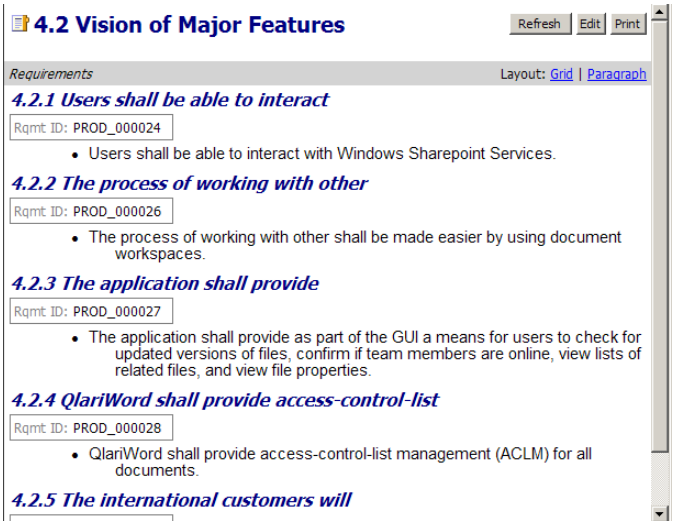


Figure 1-15. Paragraph Layout in Documents View in RM Browser

Grid Layout

The grid layout in the Document View of RM Browser displays multiple objects in a table-like list. The column headings represent attributes of the object. The rows contain the data stored in the attributes.

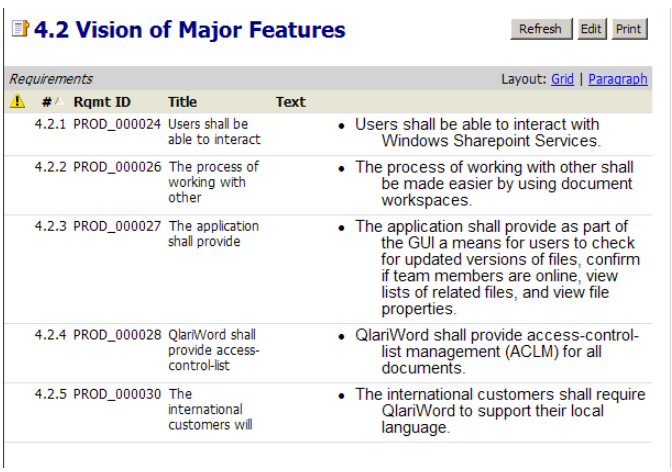


Figure 1-16. Grid Layout in Documents View of RM Browser

Queries

Queries are filters and scripts, expressed in terms of the project schema, that you use to retrieve selected objects. Filters are queries against a single class. Scripts are queries against one or more classes. Traceabililty reports are queries based on relationships. Dimensions RM has an SQL-like language that handles input parameters and performs simple computations. In general, searches of project data are based on selection criteria in which you specify constraints on attribute values and links.

The following describes filters and scripts:

- **Filters** are stored queries that you can create, name, and store.
  - **Form filters** are the simplest kind of filter, but they are limited in terms of the complexity of the selection criteria. Form filters can select for simple attribute value combinations from among the objects of a class.
  - **Complex filters** provide greater expressive power for the selection criteria. With complex filters, you can construct detailed logical expressions that use attribute values, ranges of attribute values, and membership in relationships as selection criteria.
- **Scripts** are the most comprehensive way to perform searches. They can be used to combine the selection criteria capabilities provided by complex filters, with complex link traversal, parameterization, basic calculations, and output formats. You can use any of these search mechanisms to locate data for review, modification, or export.
- **Traceability reports** are scripts that use relationships as the selection criteria. You specify a top-level class, and then select classes that have a relationship with the top-level class. You can constrain the report based on a container (baseline, collection, document, or snapshot) or category.

You can create filters and scripts in RM Browser, RM Concept, and RM Explorer. You can run filters and scripts from RM Browser and RM Concept.

You can create and run traceability reports in RM Browser. You can view a traceability report in RM Concept, but if you do, it becomes a regular script and can no longer be viewed as a traceability report in RM Browser.

In Requirements View in RM Browser, you can use the quick search feature to quickly run a query to see the content of any category based on criteria you specify.

Query Terminology

As described earlier in this chapter, a relationship connects a primary and secondary class. Relationship constraints are logical expressions that are used as filters to constrain searches. This section describes terminology and concepts that you encounter when you construct relationship constraints in queries.

NOTE Source and immediate relationships can be used to construct relationship constraints in RM Browser; however, relationship operators are not supported in RM Browser. Relationship operators can be used in combination with source and immediate relationships to construct relationship constraints in RM Explorer and RM Concept.

Relationship Operators

The relationship operators PRIMARY_IN and SECONDARY_IN are used to identify objects that are either at the origin or termination of a link. The relationship operators NOT_PRIMARY_IN and NOT_SECONDARY_IN identify objects that may participate in such links, but do not. These operators are useful in locating objects that you are interested in linking. For example, given a relationship that connects system requirements to test cases, you could use the "not" operators to find requirements that are not associated with test cases.

Source and Immediate Relationships

Source and immediate relationships are special relationships that are used to locate versions of objects.

- A *source* relationship refers to the original object in a chain of versions.
- An *immediate* relationship refers to the immediate predecessor or successor of an object.

Relationship Operators in Source and Immediate Relationships

The following table lists relationship operators and describes their meanings in source and immediate relationships.

Operator	Source	Immediate
PRIMARY_IN	Requirements that have no parents (source requirements)	Requirements that have children (not the lowest level requirements)
SECONDARY_IN	Requirements that have no children (the lowest level requirements)	Requirements that have parents (derived requirements)
NOT_PRIMARY_IN	Requirements that have parents (derived requirements)	Requirements that have no children (the lowest level requirements)
NOT_SECONDARY_IN	Requirements that have children (not the lowest level requirements)	Requirements that have no parents (the source requirements)

Reports

Reports are the results of queries made through filters and scripts. You can create scripts to generate documents, traceability matrices, and other types of reports. Named scripts are stored in the database as project resources and can be exported to the file system as text files where they can be used from the command line.

You can execute scripts from the command line, RM Browser, or RM Concept. You can export the reports to files in a variety of formats, including Microsoft® Word, Microsoft® Excel®, Rich Text Format (RTF), Comma Separated Value (CSV), HTML, and XML.

Containers

Containers are a higher grouping of any of the following objects:

- Baselines
- Collections
- Documents
- Snapshots

Collections

Collections are a way to group objects of any class. Once a collection is created, it can be associated with an object by linking the object to the collection. Each object can be linked to many different collections, and each collection can be linked to many different objects. In RM Browser, objects can be linked to collections manually. In RM Concept, objects can be linked to collections either manually or automatically. Collections can be referenced in scripts, making script creation simpler.

Parent collections contain child collections. Child collections contain objects. The hierarchy formed by the parent-child connections allows collections to be grouped into larger collections. For example, a parent collection called *Operations* can contain child collections for several types of operations, such as *Administrative*, *Storage*, and *Retrieval*.

A common use of collections is baselining. A baseline is a snapshot of objects at a particular time. You can create a collection called Baseline 1 that is a snapshot of all objects at the Alpha phase of the project. Later in the release cycle, you can create a collection called Baseline 2 that is a snapshot of all objects at the Beta phase. You can run reports that show the differences between objects in Baseline 1 and Baseline 2.

You can create collections in RM Browser, RM and Concept.

Traceability and Impact Analysis

Links allow you to specify precisely which objects are related and why they are related. The relationships that you set up in your class definition diagram, and the corresponding links among objects that you subsequently create or import, form interconnections throughout your documents, models, test assets, and other work products. These physical connections model logical connections among the project data.

Traceability and impact analysis are two ways you can analyze linkages. You can view traceability and impact analysis through reports run in RM Browser or RM Concept.

Traceability

Different kinds of traceability result from different kinds of relationships. Relationships between different requirements classes can be used to show dependencies, such as the connection between operational requirements and software requirements.

Dimensions RM also manages relationships between successive versions of a particular object. This gives you the history of the object and allows you to trace its evolution through your project life cycle.

You can use traceability to answer questions about the completeness and consistency of your requirements management effort. Such questions include:

- How many operational requirements have not yet been addressed by software or hardware requirements?
- How many software requirements are not covered by test cases?
- How many requirements had successful tests for the current build?

Impact Analysis

Having established traceability, you can perform impact analysis to examine the effects of certain changes. For example, if a particular system requirement is changed, what parts

of the dependent software or hardware requirements are affected? What parts of the design, code, or test plan are affected? The answers to these questions help you scope the effort required to absorb requirements changes.

Change Management

As discussed in "Requirement Evolution" on page 30, change management allows you to propose new objects or changes to existing objects, while keeping them separate from the existing objects. A proposed change object is an instance of the appropriate class, with its Current Status attribute set to Proposed.

Dimensions RM also provides a class type with which to build Engineering Change Proposals (ECPs). As you create a set of related proposed objects, you can link them to an ECP object so that they are easily accessible for review as a group.

ALM Integration with Dimensions CM

The Application Lifecycle Management (ALM) integration lets you associate Dimensions RM requirements to Serena® Dimensions® CM requests. When you add a requirement to or remove a requirement from a collection, Dimensions CM is notified with the relevant information. Dimensions RM baselines flow to Dimensions CM, and Dimensions CM baselines flow to Dimensions RM.

You can associate:

- Multiple Dimensions RM projects to multiple Dimensions CM products.
- One or more Dimensions RM containers (baselines, collections, documents, or snapshots) to one or more Dimensions CM projects/streams.

For more information, see the common *Dimensions CM-Dimensions RM ALM Integration Guide.*

The above referenced guide also documents a Use Case for using Dimensions CM requests to augment Dimensions RM requirement management and traceability

Demonstration Projects

The QLARIUS_RM demonstration project lets business analysts and product managers quickly understand how the key functionality of Dimensions RM is beneficial in their own requirement lifecycles. QLARIUS_RM demonstrates how requirements are categorized and stored, and how the requirements lifecycle is automated and enforced. QLARIUS_RM provides predefined requirement classes, links between classes, and built-in reporting.

RMDEMO is another demonstration project that provides a rich set of Dimensions RM features and functionality.

Chapter 2

RM Manage

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Overview

RM Manage is the Serena® Dimensions® RM tool for administering databases and projects. The data is organized by Oracle instances (databases) and Oracle users (projects) within the Serena-Supplied Runtime RDBMS or your own company's Oracle RDBMS. You can access the user and group data through separate views in the RM tool.

Only the databases in the Oracle "`tnsnames.ora`" file are displayed in the graphical tree in the left window. This file is located in the following sub-directory of the top-level installation directory of the Serena-Supplied Runtime RDBMS or your own company's Oracle RDBMS:

- Local or Remote Windows RDBMS

  `NETWORK\ADMIN`

- Remote UNIX RDBMS

  `network/admin`

To access projects in a database, you must first log in using a valid Dimensions RM administrator ID and password. When you have been authenticated for a database, the projects for which you have been assigned as an administrator are displayed as subfolders of the database. Any tools launched from RM Manage use the current user, password, database, and project settings.

Configuration

The following sections describe how to view current configuration settings or specify new ones for Dimensions RM.

NOTE Configuration information that is stored in the registry during installation can be changed after installation.

Setting RTM_HOME

RTM_HOME must be set to the Dimensions RM installation directory if it is not already correctly set by default. This value is stored in the registry and is used to locate the executables for other Dimensions RM tools.

CAUTION! If this value is not set properly, you cannot launch other Dimensions RM tools from RM Manage.

To check or set RTM_HOME:

1. Select **Workspace** | **Options**.
2. Click the **Mandatory** tab.
3. In the **RTM_HOME** field, if currently incorrectly set, enter the location of Dimensions RM or browse to the Dimensions RM installation directory.
4. Click **Apply**.

Setting ORACLE_HOME

ORACLE_HOME must be set to the Oracle installation directory if it is not already correctly set by default. This value is stored in the registry and is used to determine the top-level installation directory of the Serena-Supplied Runtime RDBMS or your own company's Oracle RDBMS (which enables RM Manage to determine where the `tnsnames.ora` file is located):

CAUTION! If this value is not set properly, you will not be able to see any database instances that are not local to the machine you are using.

To check or set ORACLE_HOME:

1. Select **Workspace | Options**.
2. Click the **Mandatory** tab.
3. In the **ORACLE_HOME** field, if currently incorrectly set, enter the location of Oracle or browse to the Oracle installation directory (for example, `C:\Oracle\ora10g`).
4. Click **Apply**.

Setting the Header Text

To check or set header text:

1. Select **Workspace** | **Options**.
2. Select the **Optional** tab.
3. If you want to change the header text, type the text of the header in the **Header Text** field.
4. Select **Apply**.

Setting the Footer Text

To check or set footer text:

1. Select **Workspace** | **Options**.
2. Select the **Optional** tab.
3. If you want to change the header text, type the text of the footer in the **Footer Text** field.
4. Select **Apply**.

Setting the License Server

To check or set the license server:

1. Select **Workspace** | **Options**.
2. Select the **License** tab.

3 In the **License Server** field, if currently incorrectly set, type the name of the license server

4 Select **Apply**.

Setting the Location of the Database Password File

The database password security file (`security.dat`) contains a security token and the encrypted database password for the Oracle users `ICADMIN` and `ICPROJECTS`. If an administrator changes the default location of this file, you will be requested to modify the location.

To check or set the location of the security.dat file:

1 Open RM Manage.

NOTE You do not need to log into Dimensions RM to perform this task.

2 Select **Workspace | Options**.

3 The **Workspace Options** dialog opens.

4 Click the **Security** tab.

5 In the **Security File** dialog box, if currently incorrectly set, type the full path to the `security.dat` file or browse to it.

6 Click **OK**.

Managing Projects

Dimensions RM allows you to administer projects and databases through the RM Manage and Class Definition tools. You can perform all administrative tasks, including setting up and configuring directories, creating projects, setting up user accounts and passwords and restoring projects from backup. Using the Class Definition tool, you can organize information according to types and define the attributes for each type.

Creating a New Project

A project is a work area where information is created and maintained. Dimensions RM provides you with the ability to create and delete project accounts, backup and restore projects, partition databases to optimize performance and administer user accounts.

To create a new project:

1 Select the database in which you want to add the new project.

2 Right-click the database and select **New Project**.

3 The **Please enter password** dialog box opens.

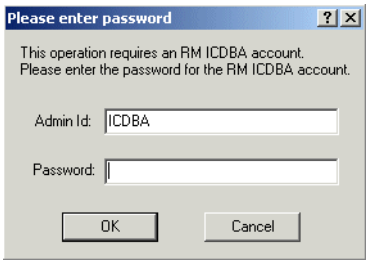


Figure 2-1. ICDBA Password

4 In the **Password** field, type the password for the Dimensions RM `ICDBA` account (this is initially `ICDBA` by default).

5 The **Please Enter Project Information** dialog box opens.

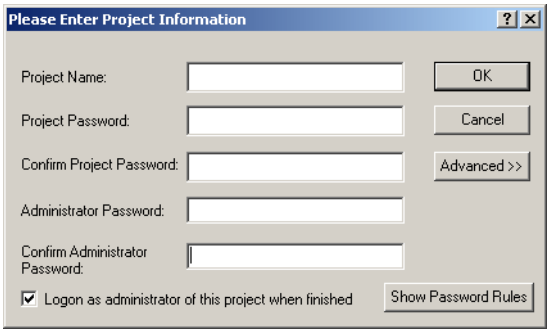


Figure 2-2. Project Information

The project password is one that Dimensions RM uses as an Oracle user password. It is not needed to use Dimensions RM. The administrator account (which is automatically created and named by appending `Admin` to the project name, for example, `MyprojectAdmin`) and password are the ones you need to remember when you first open the project.

6 Type a project name (for example, `MYPROJECT`).

7 Type a project password (for example, `MYPROJECT`) in the **Project Password** field and retype it in the **Confirm Project Password** field.

NOTE Project passwords cannot begin with a number. For example, 12345 causes an error; however, a12345 is accepted. Click **Show Password Rules** for a summary of the rules.

8 Type your system administrator's password in the **Administrator Password** field (for example, `MYPROJECT`). (An Oracle privileged account is required to create new projects.) Retype your system administrator's password in the **Confirm Administrator Password** field.

Depending on the sizes of various tables in your database, for particular tables, **Tablespace Error** dialog boxes may open during project creation to indicate that a particular table is not at high enough value. If this occurs, for each **Tablespace Error** dialog box:

a Read and take note of the error message in the dialog box.

b Click **Yes**. A **Resize Tablespace** dialog box will open.

c In the **Resize Tablespace** dialog box, enter in **New Datafile Size** the new tablespace size (at least) recommended in Step a.

d Click **Resize**. A **Resize** dialog box will open.

e In the **Resize** dialog box, click **Yes**.

f In the **Resize Tablespace** dialog box, click **Close**.

9 For information concerning the features that can be accessed via **Advanced**, see "Advanced Options for Creating a New Project" on page 46.

10 Click **OK** when you are informed that the project has been created.

11 Click **OK**. The **Import** dialog box opens.

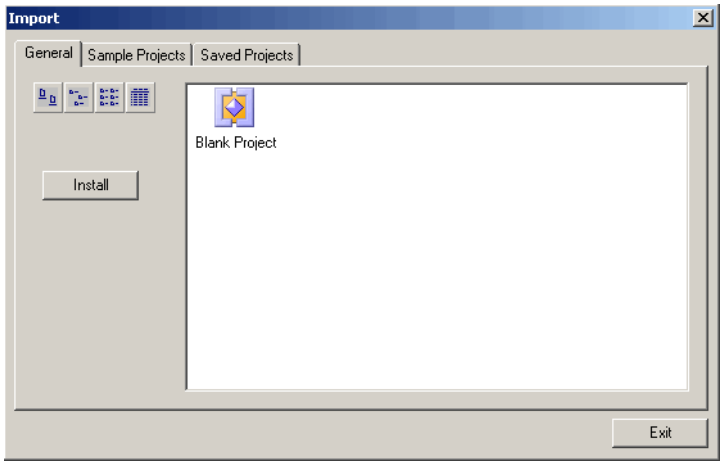


Figure 2-3. Import

The **Import** dialog box allows tables to be installed in the newly created project. Four options are available:

- **Do not install tables**—Click **Exit** without selecting any files. If you do not install tables, that is, exit without installing, you can either remove the project or install the tables later.
- **Install RM tables only**—Select **Blank Project** from the **General** tab.
- **Install a sample project**—Select the project from the **Sample Projects** tab.

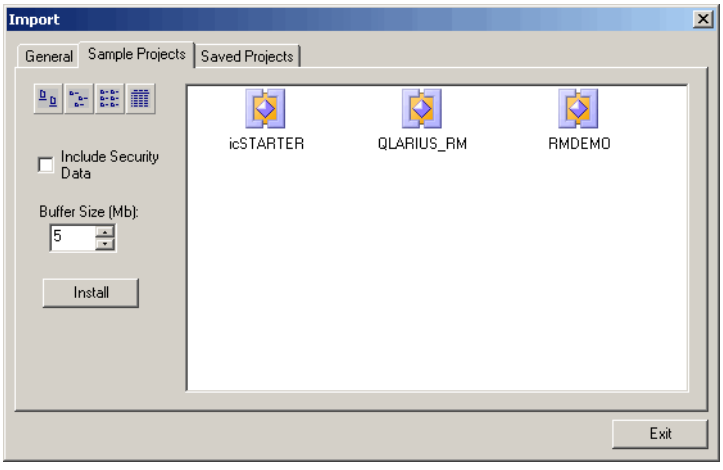


Figure 2-4. Import Project

- **Install a saved project**—Select the project from the **Saved Projects** tab.

Projects displayed with a project icon contain data. Projects displayed with a class icon contain only the project schema.

NOTE If you are installing a saved project or a sample project, you may install the security information for that project by selecting the **Include Security Data** check box. The security information includes user accounts, user groups and access right definitions.

For most imports, a 1 MB buffer is sufficient, but for large project schemas you may increase the buffer size. The buffer is the amount of temporary space that is needed to complete the import command. The amount of buffer space used by the Oracle import command may be increased up to 100 MB.

12 Click **Install** to install tables (or **Exit** if you do not want to install tables).

If you installed a saved project or a sample project, you will be given the option to view the log file. The log file is saved in the directory where the dump file exists and has the same name with a .log extension, rather than a .cdd or .dmp extension. Click **Yes** or **No** as appropriate.

NOTE See the Dimensions RM readme for information on possible Oracle errors that can be safely ignored.

13 The default tablespace size for new projects is 160 MB. If this is not large enough to accommodate data contained in the project that is being imported, you can resize the tablespace by using the **Administer Tablespaces** dialog box.

To resize an existing tablespace, highlight the database and select **Administer Tablespace**. The **Administer Tablespaces** dialog box opens.

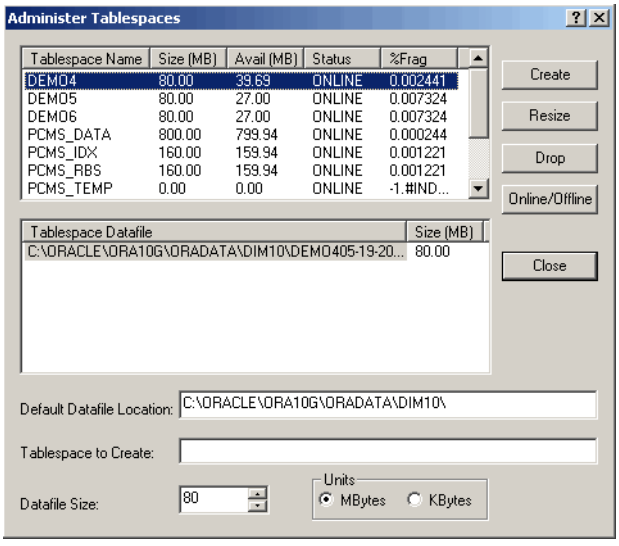


Figure 2-5. Administer Tablespaces

14 Select a datafile size and click **Resize**. A prompt asks "Do you wish to resize an existing datafile?".

15 Click **Yes**.

16 Click **Close**.

Advanced Options for Creating a New Project

The **Advanced** button on the **Please Enter Project Information** dialog box provides access to advanced tablespace options for new projects, such as inserting the new project into a pre-existing tablespace and changing the default tablespace size.

To use advanced options:

1 In the **Please Enter Project Information** dialog box, click **Advanced**. The dialog box expands to show advanced options.

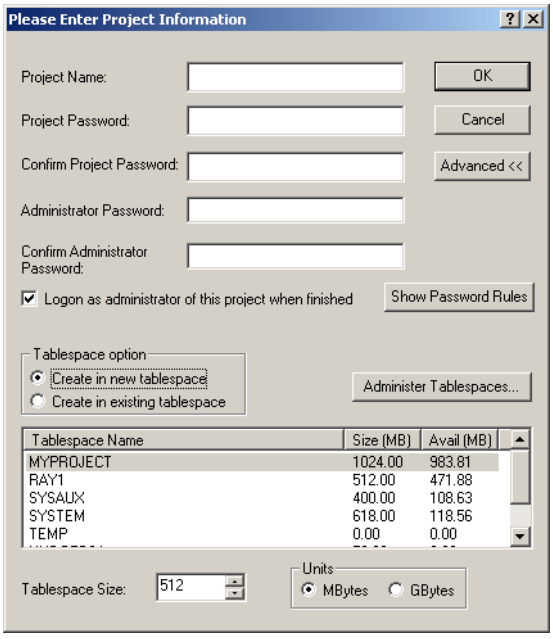


Figure 2-6. Advanced Options for Creating New Projects

2 To insert the new project into a pre-existing tablespace, click **Create in existing tablespace**, and then select a tablespace from the list. Otherwise, the project will be created in a new tablespace.

3 If you choose to create the project in a new tablespace, you can change its size from the default size of 160 MB by editing the value in the **Tablespace Size** list box and selecting a **Units** option (megabytes or gigabytes).

4 If you choose to create the project in an existing tablespace and you want to adjust the size of that tablespace to ensure it has enough space to hold the new project, click **Administer Tablespaces** to access the tablespace management features (described in "Administering Tablespaces" on page 80).

Changing the Project Password

To change the project password:

1 Select the project for which you want to change the password.

2 Select **File** | **Change Project Password**, click the **Change Project Password** button , or right-click the project and select **Change Project Password**.

3 Enter your system administrator password.

4 Click **OK**.

5 Enter a new password and confirm the password for the project.

6 Click **OK**.

Backing Up a Project Account

IMPORTANT! In the following, ensure that you select **Backup/Restore Project Account** rather than **Backup/Restore Project Schema**.

When you back up a project account, you back up an Oracle account containing:

- Oracle tables holding the entire Dimensions RM schema metadata.
- Other Oracle tables holding the actual requirement data.

Whereas, when you backup a project schema, you only back up the schema data, that is, the requirement data is *not* included.

To back up a project account:

1 Ensure that no users are accessing Dimensions RM.

2 It is advisable to first place each project account offline, see "Placing a Project Account Offline" on page 53.

3 Stop the **Serena Dimensions RM E-Mail Service** service.

This can be done from the following locations:

- RM Mail **Control** tab (see "Control Tab" on page 99)
- Windows **Services** (from the Windows **Control Panel**, double-click **Administrative Tools** and then double-click **Services**).

4 Select the project you want to back up.

5 Select **File** | **Backup/Restore Project Account**, click the **Backup/Restore Project Account** button , or right-click the project and select **Backup/Restore Project Account**.

6 If prompted, enter your administrator password and click **OK**.

7 Enter a file name to store the project account backup. You may type the file name or select it by clicking the browse button and searching for the file. If you save the project in Saved Projects directory in the current Dimensions RM installation directory, you will need to move it to the upgraded Dimensions RM installation directory if you want it to be available for installation directly from the installation dialog that is displayed when creating a new project under the **Saved Projects** tab.

8 If you are using the Browse function, click **Open** to display the path to the file in the **Backup/Restore Project** dialog box.

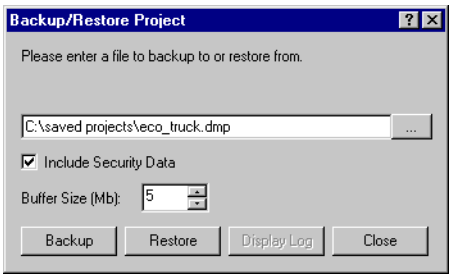


Figure 2-7. Backup/Restore Project

9 To include the security information for this project, check the **Include Security Data** check box. This will export all the users that have been assigned to this project as well as their permissions so that they may be imported into another project.

10 Change buffer size, if needed. For most imports or exports, a default buffer size of 5MB should be sufficient, but for large project schemas you may wish to increase the buffer size. This is the amount of temporary space that is needed to complete the Oracle import/export command. The amount of buffer space used by the Oracle import/export command may be increased up to 100 MB.

11 Click **Backup**.

12 Click **Display Log** to view the output from the backup. The log file is saved in the directory where the dump file exists and has the same name with a .log extension instead of a .dmp extension.

13 Restart the **Serena Dimensions RM E-Mail Service** service.

14 Place each project account back online if you placed it offline to do the back up, see "Placing a Project Account Online" on page 53.

Restoring a Project Account from a Backup

IMPORTANT! In the following, ensure that you select **Backup/Restore Project Account** rather than **Backup/Restore Project Schema**.

When you back up a project account, you back up an Oracle account containing:

- Oracle tables holding the entire Dimensions RM schema metadata.
- Other Oracle tables holding the actual requirement data.

Whereas, when you backup a project schema, you only back up the schema data, that is, the requirement data is *not* included.

To restore a project account from a backup using the RM Manage interface:

1 Stop the **Serena Dimensions RM E-Mail Service** service.

This can be done from the following locations:

- RM Mail **Control** tab (see "Control Tab" on page 99)
- Windows **Services** (from the Windows **Control Panel**, double-click **Administrative Tools** and then double-click **Services**).

2. Check that the project you wish to restore has `(Current)` next to its name. If this is not the case (for example it has a a suffix of (`VRM2009R2 GA`)), then you will first need to run the **Convert Database** command on the database and its project accounts before performing the project account restores. Proceed as follows:

   a Right click on the Dimensions RM database in the left-hand graphical tree.

   b Select **Convert Database**. The **Database Validation** dialog box appears.

   c Click the Dimensions RM database in the **Database Validation** dialog box graphical tree. The **ICDBA Password** dialog box appears.

   d Enter the ICDBA Password (`ICDBA` by default) and click **OK**.

   e The **Database Validation** dialog box displays the various project accounts and their current status.

   f Select a project account that requires updating and click **Upgrade**. The **Conversion Progress** dialog box appears.

   g Click **Continue**.

   h When the **Conversion Progress** dialog box reports successful upgrading of the project, click **Close**.

   i Repeat Step f to Step h for any other projects that require upgrading.

   j When all projects have been upgraded, click **Close** in the **Database Validation** dialog box.

3. Select the project you want to restore.

4. Select **File | Backup/Restore Project Account**, click the **Backup/Restore Project Account** button , or right-click the project and select **Backup/Restore Project Account**. If data already exists in the project account, you are prompted to confirm that you want to restore data. Any data existing in the project account will be overwritten during the restore.

5. Enter the name of the file to restore from. You may type the file name or select it by clicking **Browse** and searching for the file in the directory.

6. To include the security information for this project, select the **Include Security Data** check box. This will import all the users that have been assigned to the project that is being imported as well as their permissions.

7. Change buffer size if needed. For most imports/exports a buffer size of 1 MB should be sufficient, but for large project schemas you may wish to increase the buffer size. This is the amount of temporary space that is needed to complete the Oracle import/export command. The amount of buffer space used by the Oracle import/export command may be increased up to 100 MB.

8. Click **Restore**.

   The existing tablespace may not be large enough to accommodate the data contained in the project that is being restored. In this case, you will be asked if you would like to resize the tablespace before continuing. The process of resizing the tablespace is discussed in "Resizing a Tablespace" on page 81.

9. Click **Display Log** to view the output from the restore. The log file is saved in the directory where the dump file exists and has the same name with a .log extension instead of a .dmp extension.

10 Restart the **Serena Dimensions RM E-Mail Service** service.

Backing Up Projects from the Command Line

In addition to using the **Backup/Restore Project Account** option in RM Manage, you can back up a project from the command line. The security information for the project is automatically included in the backup.

To back up a project from the command line:

1 Enter the following command:

```
icmanage -location <database instance name> -project <project name>
-password <project password> [-buffer <buffer size>] -dumpfile <name
and path of backup file to be created>
```

where:

Parameter	Value	Description
`icmanage`	RM Manage executable	If `<RM Install Dir>\bin` is not specified in your `PATH` environment variable, you must navigate to the `<RM Install Dir>\bin` directory.
`-location`	`database instance name`	Oracle database instance name (connection stream).
`-project`	`project name`	Name of the project to be backed up.
`-password`	`project password`	Password that is used for the project, *not* the Dimensions RM user account password.
`-buffer` (optional)	`buffer size`	Size of the buffer, as a positive integer. This is the amount of temporary space needed to complete the Oracle import/export command. For example, `-buffer 65` reserves 65 MB of buffer space. The buffer size can be a maximum of 100 MB, and the default is 50 MB.
`-dumpfile`	`name and path of dumpfile`	Name and location of the backup file. When it is created, the name is appended with the `<timestamp>.dmp` extension. The timestamp format is DD_MM_YYYY_HH_MI_SS. If no path is specified, the file is stored in the `Saved Projects` folder of the `<RM Install Dir>` directory.

The following command backs up RMProject with a password of pwd to a file named rmprojectbackup in the backup directory of the E drive. The Oracle instance name is orcl1.

```
icmanage -location orcl1 -project rmproject -password pwd -dumpfile
e:\backup\rmprojectbackup
```

When you execute this command, the backup file `rmprojectbackup<timestamp>.dmp` is created in the `backup` folder on drive E. If

the backup folder does not exist, it is also created. The buffer size is the default of 50 MB.

NOTE The project cannot be restored from the command line. You can, however, restore the dumpfile using the RM Manage tool.

Deleting a Project Account

When you delete a project account, the project user account and all data associated with the account is deleted from Oracle. You cannot retrieve deleted project data.

To delete a project account:

1. Select the project you want to delete.
2. Select **File** | **Delete Project Account**, click the **Delete** button, or right-click the project and select **Delete Project Account**.
3. Click **Yes** to confirm the deletion.

Defining the Project Schema

To define the project schema:

1. Select the project for which you want to define the schema.
2. Select **File** | **Define Project Schema**, click the **Define Project Schema** button, or right-click and select **Define Project Schema**. The Class Definition tool appears.
3. Define the project schema in the Class Definition tool. Refer to Chapter 3, "Class Definition" on page 115 for information about Class Definition.

Backing Up a Project Schema

To back up project schema:

1. Select the project you want to back up.
2. Select **File** | **Backup/Restore Project Schema**, click the **Backup/Restore Project Schema** button, or right-click the project and select **Backup/Restore Project Schema**. (See also "Backing Up a Project Account" on page 47, which explains the difference between a project account and a project schema.)
3. Enter a file name to store the project schema backup. You can type the file name or select it by clicking **Browse** and searching for the file.

4 Click **Open**. The **Backup/Restore Schema** dialog box opens.

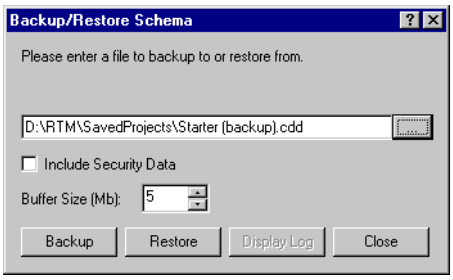


Figure 2-8. Backup/Restore Schema

NOTE If you save the project in Saved Projects directory in the current Dimensions RM installation directory, the schema will be available for installation from the installation dialog box that is displayed after creating a new project under the **Saved Projects** tab.

5 To include the security information for this project, select the **Include Security Data** check box. This will export all the user accounts that have been assigned to this project schema, as well as user permissions, so that this data can be imported into another project.

6 Change buffer size, if desired. For most imports and exports, a buffer size of 1 MB should be sufficient, but for large project schemas you may increase the buffer size. This is the amount of temporary space that is needed to complete the Oracle import/export command. The amount of buffer space used by the Oracle import/export command may be increased up to 100 MB.

7 Click **Backup**.

8 Click **Display Log** to view the output from the backup. The log file is saved in the directory where the dump file exists and has the same name with a .log extension instead of a .cdd extension.

Restoring a Project Schema from a Backup

To restore a project schema from backup:

1 Select the project you want to restore.

2 Select **File** | **Backup/Restore Project Schema**, click the **Backup/Restore Project Schema** button , or right-click the project and select **Backup/Restore Project Schema**. (See also "Restoring a Project Account from a Backup" on page 48, which explains the difference between a project account and a project schema.)

3 Enter the name of the file to restore from. You can type the file name or select it by clicking **Browse** and searching for the file in the directory.

4 To include the security information for this project, select the **Include Security Data** check box. This will import all the users that have been assigned to the project that is being imported as well as their permissions.

5 Change buffer size if needed. For most imports/exports a buffer size of 1 MB should be sufficient, but for large project schemas you may wish to increase the buffer size. This is the amount of temporary space that is needed to complete the Oracle import/

export command. The amount of buffer space used by the Oracle import/export command may be increased up to 100 MB.

6 Click **Restore**.

The existing tablespace may not be large enough to accommodate the data contained in the project that is being restored. In this case, you will be asked if you would like to resize the tablespace prior to continuing. See "Resizing a Tablespace" on page 81 for information about resizing the tablespace.

7 Click **Display Log** to view the output from the backup. The log file is saved in the directory where the dump file exists and has the same name with a .log extension instead of a .dmp extension.

8 To close the dialog box, click **Close**.

Placing a Project Account Online

If you have placed a project offline to perform backups or to prevent users from accessing a project, you can place it online again.

To place a project account online:

1 Select the project you want to place online.

2 Select **File**| **Place Project Account Online**, click the **Place Project Account Online** button, or right-click and select **Place Project Account Online**.

Placing a Project Account Offline

Placing a project offline is a convenient way to stop users from accessing a project. You can also place a project offline when performing backups.

To place a project account offline:

1 Select the project you want to place offline.

2 Select **File** | **Place Project Account Offline**, click the **Place Project Offline** button, or right-click and select **Place Project Account Offline**.

Installing Project Tables

To install project tables:

1 Select the project for which you want to install tables.

2 Select **File** | **Install Project Tables**, click the **Install Project Tables** button, or right-click the project and select **Install Project Tables**.

3 Click **Yes** to confirm the installation.

Dropping Project Tables

To drop project tables:

1 Select the project for which you want to drop tables.

2 Select **File** | **Drop Project Tables**, click the **Drop Project Tables** button , or right-click the project and select **Drop Project Tables**.

3 Click **Yes** to confirm the deletion.

Recreating Database Procedures

Use this function to ensure that you are using the most recent database procedures. For example, you may want to recreate database procedures after a compilation failure. Recreating the database procedures will synchronize them with the installed version of Dimensions RM.

To recreate database procedures:

1 Select the project for which you want to recreate the database procedures.

2 Select **File** | **Recreate Procedures**, click the **Recreate Database Procedures** button , or right-click the project and select **Recreate Database Procedures**.

3 Click **Yes** to confirm the recreation.

Recreating Database Indexes

Recreating database indexes increases Dimensions RM performance. This function rebuilds the database trees of Dimensions RM, which may become fragmented during use.

To recreate database indexes:

1 Select the project for which you want to recreate the database indexes.

2 Select **File** | **Recreate Indexes**, click the **Recreate Database Indexes** button , or right-click the project and select **Recreate Database Indexes**.

3 Click **Yes** to confirm the recreation.

Recreating Database Resources

You can recreate database resources if the database becomes damaged. This function verifies that a unique ID is assigned to the database resources.

To recreate database resources:

1 Select the project for which you want to recreate the database resources.

2 Select **File** | **Recreate Resources**, click the **Recreate Resources** button , or right-click the project and select **Recreate Resources**.

3 Click **Yes** to confirm the recreation.

Setting Link Options for Baselines

By default, users cannot modify links between objects that are included in baselines. If you want to allow users to modify links in a baseline, you can modify this on a baseline by baseline basis in RM Manage.

To set link options for baselines:

1 Select the project containing the baselines you want to modify.

2 Click the **Baseline Link(s)** button. The **Baseline link(s)** dialog box opens. All baselines in the current project appear.

3 Either:

- de-select any baseline in which you want to allow users to modify links, or
- select a baseline to freeze all links within that baseline.

If you want to select or de-select all entries, check the **Select/deselect All Baseline(s)** check box.

4 Click **OK**.

Managing Users and Groups

In the Dimensions RM environment, a project represents a work area within which information is created and maintained. Only projects that the current user is allowed to administer will be available.

Administering Users

Dimensions RM users are maintained for each database and the users are shared across all projects contained within that database. Dimensions RM users are used to maintain security with the Dimensions RM tools.

In order to administer users, at least one Dimensions RM project must exist in the database and a project administrator must have logged onto the database. Only project administrators are allowed to modify user information.

Creating a New User

To create a new user:

1 Select **View** | **Users**.

2 Select the "`Users - <Dimensions_RM_active_database_name>`" folder at the top of the left-hand graphical tree (for example, **Users - RM**).

3 Select **File** | **New User**, click the **New User** button, or right-click and select **New User**.

4 Type the name of the new user.

5 Press **Enter**. The user information dialog box opens.

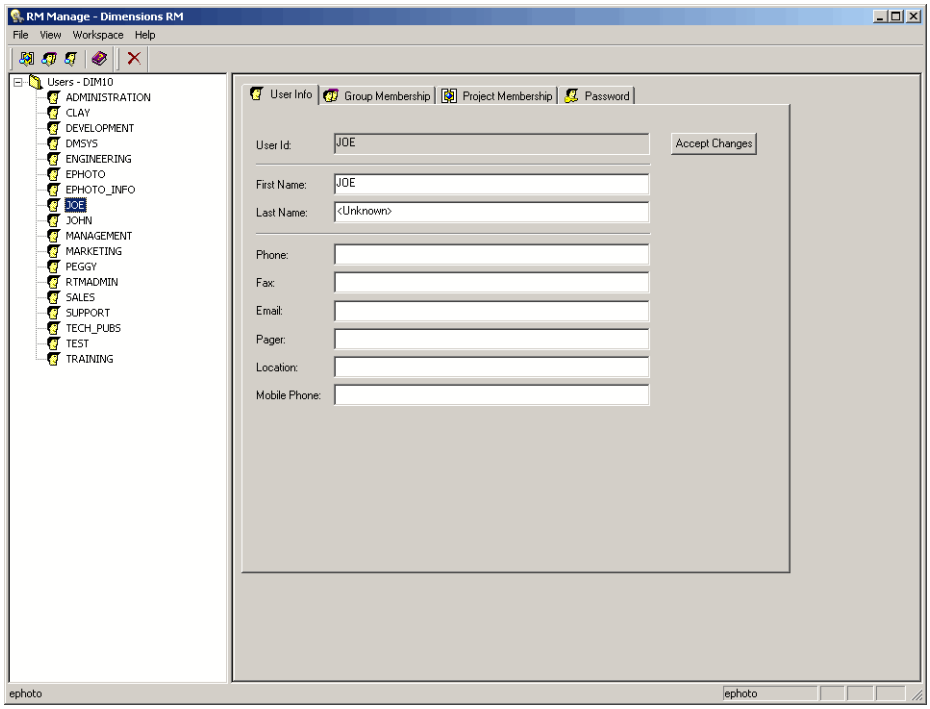


Figure 2-9. User Information

6 On the **User Info** tab, type the general user information and then click **Accept Changes**.

7 Click the **Password** tab and enter a password in the **Password** field.

8 Enter the password again in the **Confirm Password** field.

9 Select one or more of the following password options:

- **User Must Change Password at Next Logon**
- **User Cannot Change Password**
- **Password Never Expires**
- **Account Disabled**

NOTE If you do not select a password option, users must change their passwords every 60 days. Users get a warning that gives them the opportunity to change their password 14 days before their current password is due to expire. The warning is displayed every time users log in using any Dimensions RM tool.

10 Click **Accept Changes**.

NOTE For information about password security, see "Setting Up Password Security" on page 109.

Deleting a User

To delete a user:

1 Select **View** | **Users**.

2 Select the user in the left-hand graphical tree that you want to delete.

Only users that have not been assigned to any projects should be deleted. If the user profile is deleted it will be removed from every project that it has been assigned to.

3 Select **File** | **Delete User**, click the **Delete User** button, or right-click and select **Delete User**.

4 Click **Yes** to confirm the deletion.

Changing User General Information

To change general information for a user:

1 Select **View** | **Users**.

2 Select the user in the left-hand graphical tree for which you want to change the general information.

3 Click the **User Info** tab.

4 Enter new user information.

5 Click **Accept Changes**.

Changing User Password Information

To change user password information:

1 Select **View** | **Users**.

2 Select the user in the left-hand graphical tree for which you want to change the password information.

3 Click the **Password** tab.

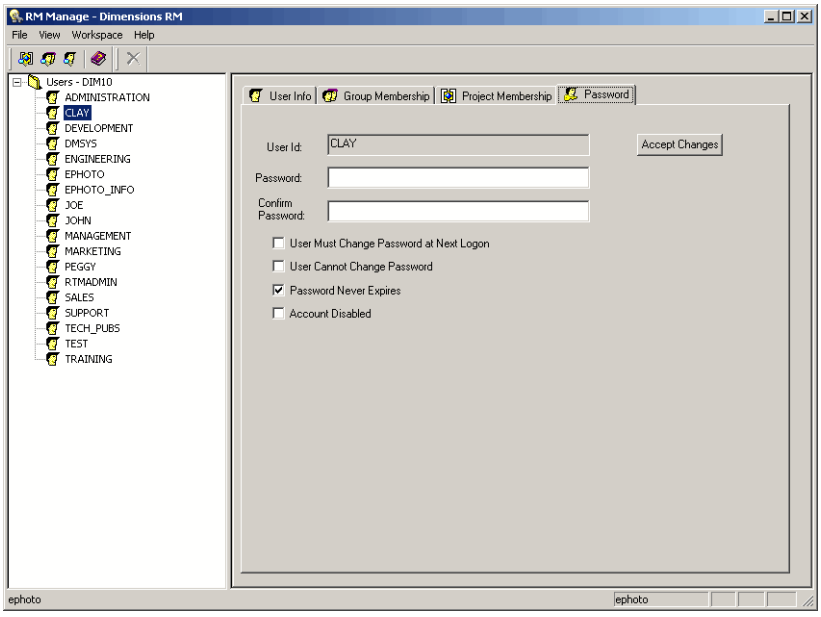


Figure 2-10. User Password Information

4 Enter new user password information.

5 Click **Accept Changes**.

Adding a User to a Group

To add a user from the user view:

1 Select **View** | **Users**.

2 Select the user in the left-hand graphical tree you want to add to a group.

3 Click the **Group Membership** tab.

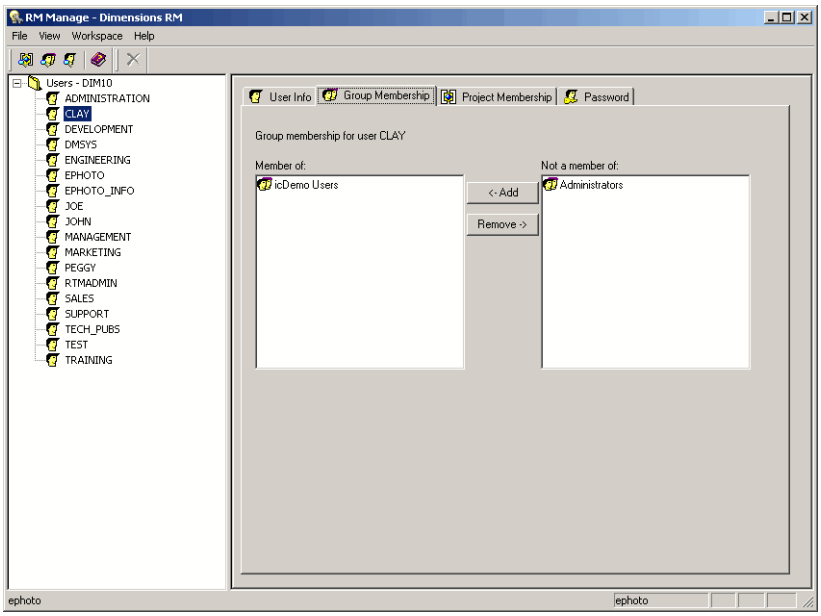


Figure 2-11. User Group Membership

4 Select the groups to which you want to add the user from the list on the right.

5 Click **Add**.

To add a user from the group view:

1 Select **View** | **Groups**.

2 Select the group in the left-hand graphical tree to which you want to add a user.

3 Click the **Members** tab.

4 Select the users that you would like to add to the group from the list on the right.

5 Click **Add**.

Removing a User from a Group

To remove a user from the user view:

1 Select **View** | **Users**.

2 Select the user in the left-hand graphical tree you want to remove from a group.

3 Click the **Group Membership** tab.

4 Select the groups from which you want to remove the user from the list on the left.

5 Click **Remove**.

To remove a user from the group view:

1 Select **View** | **Groups**.

2 Select the group in the left-hand graphical tree to which you want to remove a user.

3 Click the **Members** tab.

4 Select the users that you would like to remove from the group from the list on the left.

5 Click **Remove**.

Viewing Project Assignment

To view project assignment:

1 In the left-hand graphical tree either:

- select **View** | **Users**, or
- select **View** | **Groups.**

  and select the user or group for which you want to view project assignment.

2 Click the **Project Membership** tab.

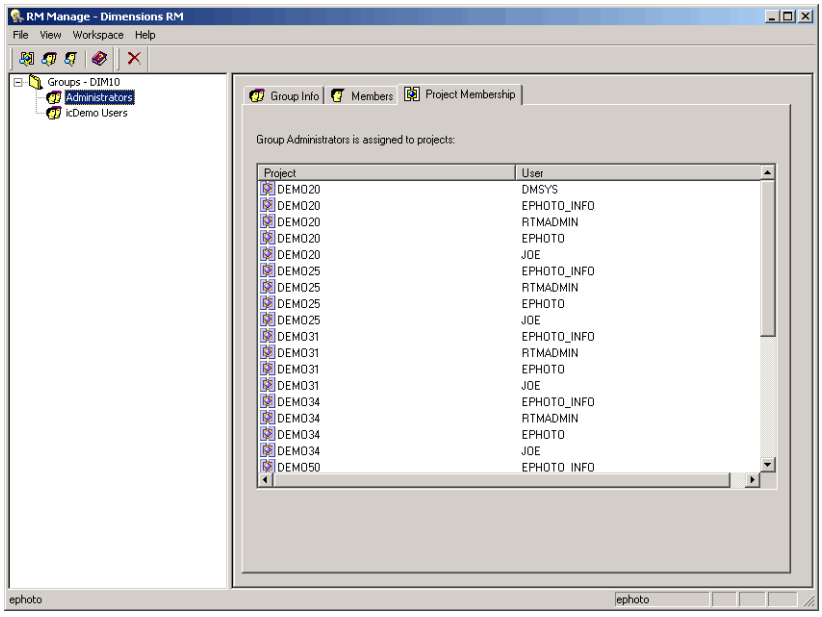


Figure 2-12. Project Membership

Administering Groups

Dimensions RM groups are maintained for each database. The groups are shared across all projects contained within that database. Dimensions RM groups are used to maintain security within the Dimensions RM tools.

In order to administer groups, at least one Dimensions RM project must exist in the database and a project administrator must have logged onto the database. Only project administrators are allowed to modify group information.

Creating a New Group

To create a new group:

1. Select **View** | **Groups**.
2. Select the "`Groups - <Dimensions_RM_active_database_name>`" folder at the top of the left-hand graphical tree (for example, **Groups - RM**).
3. Select **File** | **New Group**, click the **New Group** button, or right-click and select **New Group**.
4. Type the name of the new group and press **Enter**.

   The group information dialog box opens.

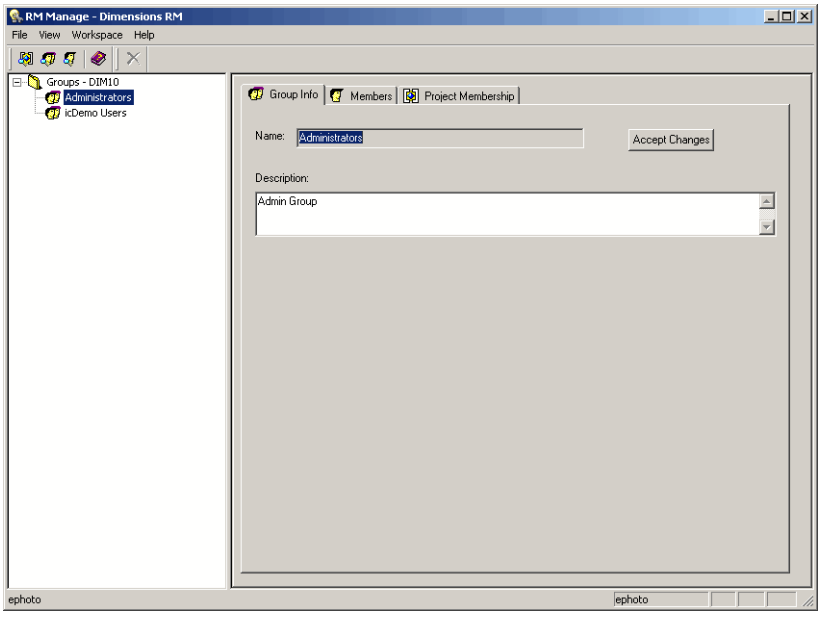


Figure 2-13. Group Information

5. Click the **Group Info** tab and enter a user description.
6. Click **Accept Changes**.

Deleting a Group

To delete a group:

1. Select **View** | **Groups**.
2. Select the group in the left-hand graphical tree that you want to delete.

NOTE Do not delete a group if a member of that group is assigned to a project. If such a group is deleted, all members of the group will be removed from every project to which they are assigned.

3 Select **File** | **Delete Group**, click the **Delete Group** button, or right-click and select **Delete Group**.

NOTE This action cannot be undone.

4 Click `Yes` to confirm the deletion.

Changing Group General Information

To change general information for a group:

1 Select **View** | **Groups**.

1 Select the group in the left-hand graphical tree for which you want to change the general information.

2 Click the **Group Info** tab.

3 Enter new group information.

4 Click **Accept Changes**.

Assigning Users to Groups

A user must be assigned to a project through group membership before being allowed access to the project.

Adding a User to a Project

To add a user to a project:

1 Select **View** | **Projects**.

2 Select the project in the left-hand graphical tree to which you want to add the user.

3 Click the **Group Assignment** tab.

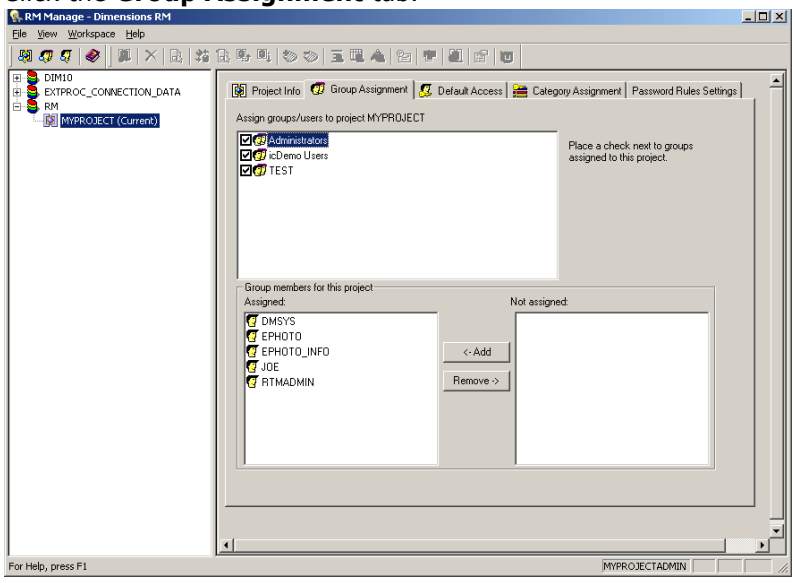


Figure 2-14. Group Assignment

4 Select the group that contains the user you want to add to the project. Selecting the check box automatically adds all members of that group to the project. Clearing the check box automatically removes all members of that group from the project.

5 Select the users from the **Not Assigned** list.

6 Click **Add**.

Adding an Administrator to a Project

To add an administrator to a project:

1 Add the user to the Administrators group (see "Adding a User to a Group" on page 58).

1 Select **View** | **Projects**.

2 Select the project in the left-hand graphical tree to which you want to add the administrator user.

3 Click the **Group Assignment** tab.

4 Select the **Administrators** group.

5 Select the user from the **Not Assigned** list.

6 Click **Add**.

Removing a User from a Project

To remove a user from a project:

1 Select **View** | **Projects**.

2 Select the project in the left-hand graphical tree from which you want to remove the user.

3 Click the **Group Assignment** tab.

4 Select the group that contains the user you want to remove from the project. Selecting the check box automatically adds all members of that group to the project. Clearing the check box automatically removes all members of that group from the project.

5 Select the users from the **Assigned** list.

6 Click **Remove**.

Resource Types

A resource is a data item such as a class, an attribute, or a document. A resource type represents a grouping of resources into a class of items. For example, a specific document falls into the type of "RMWord Documents." Each resource type has transactions that are appropriate for that type of resource. Transactions represent what can be done with that resource.

Setting Default Group Access

NOTES As a good general practice, Serena recommends that no Dimensions RM group ever be granted the class access rights for: REMOVE, UPDATE, and UPDATE NON_CURRENT.

Update should not be granted to anyone on the system. All requirements changes should be performed with the replace function. This approach allows a fully auditable change history to be maintained and thus exposes Dimensions RM full capabilities. But this approach does require that you baseline requirements to capture the versions that you are currently capturing with the replace button. If users start using baselines and snapshots with other usage models (primarily updates and replace to version), they will be forced to create a new version just because someone else created a baseline. This may also limit the compare functions in Dimensions RM.

Default access rights may be set for a group. When you set default group access, all members of a group that do not have explicit access granted or denied (that is, they have inherited access) receive the access rights of their collective parent groups. The access rights that are granted are for types of entities, rather than for explicit instances of those entity types. The access rights that are granted here may be overridden for explicit instances. See "Security" on page 155 for details on overriding class definition default access.

1 Select **View** | **Projects**.

2 Select the project in the left-hand graphical tree for which you want to set default access.

3 Click the **Default Access** tab.

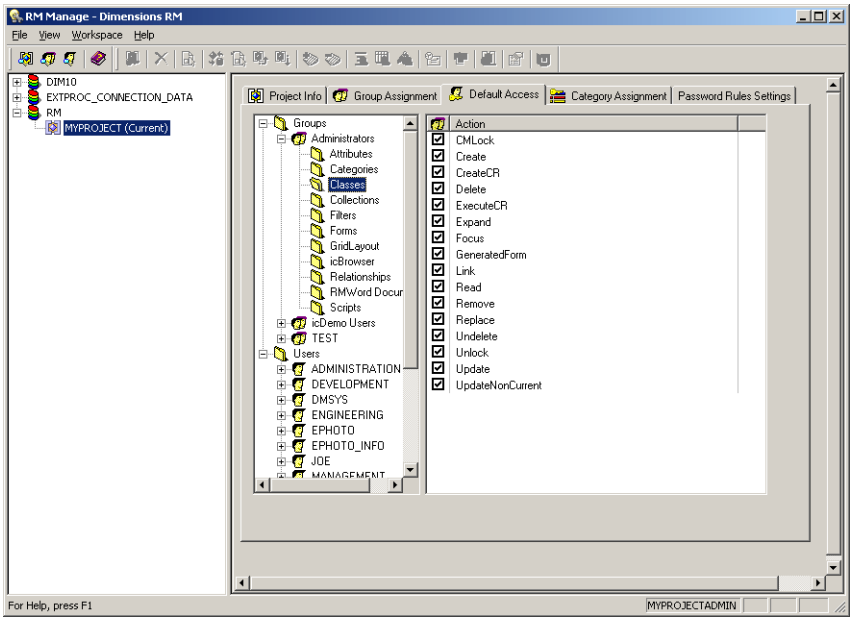


Figure 2-15. Default Access for Groups

4 Click + to expand the **Groups** folder.

5 Expand the group to see the types of resources that may be assigned default access.

6 Select the type (for example, Classes).

7 Click the transaction to toggle the access rights. Select the check box to assign group access rights ☑ or to unassign rights ☐.

Setting Default User Access

NOTES As a good general practice, Serena recommends that no Dimensions RM user (including Administrators) ever be granted the class access rights for: REMOVE, UPDATE, and UPDATE NON_CURRENT.

Update should not be granted to anyone on the system. All requirements changes should be performed with the replace function. This approach allows a fully auditable change history to be maintained and thus exposes Dimensions RM full capabilities. But this approach does require that you baseline requirements to capture the versions that you are currently capturing with the replace button. If users start using baselines and snapshots with other usage models (primarily updates and replace to version), they will be forced to create a new version just because someone else created a baseline. This may also limit the compare functions in Dimensions RM.

Default access rights can be set for users. A user may be granted access, denied access, or may inherit the access rights of his or her parent groups. The access rights are for types of entities, rather than for explicit instances of those entity types. The access rights may be overridden for explicit instances in other tools.

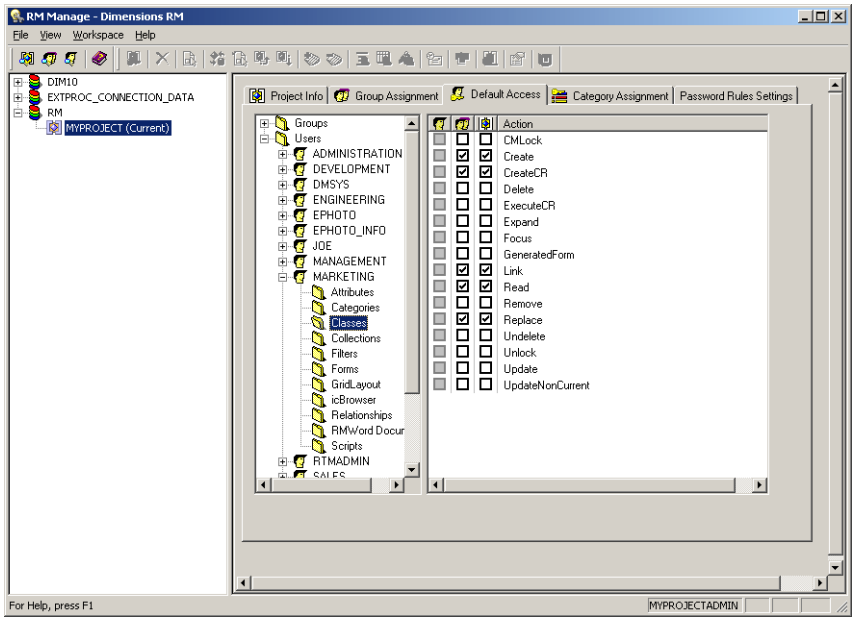


Figure 2-16. Default Access for Users

The group column in the right-hand list represents the access that has been set for the collective default access of the groups of which the user is a member. If the group column is checked (☑), the transaction has been granted for one or more of the groups. If the group column is not checked (☐), the group has not been given default access.

The user column in the right-hand list represents the access that has been set for the individual user. The rows that are gray (▢) in the user column indicate that the user does not have any default access set for this transaction and will inherit the collective access from the group. The rows that are unchecked in the user column indicate that the user has been explicitly denied default access for this transaction. The rows that are checked in

the user column indicate that the user has been explicitly granted default access for this transaction.

The project column in the right-hand list indicates the net effect of the user and group default access for the project. If this column is checked, the user has default access, either because it has been explicitly granted for the user or has been inherited from his or her groups. If this column is not checked, the user does not have default access, either because it has been explicitly denied or because default access has not been granted for any groups and the access has been inherited.

Granting All

Granting All Access Rights to a Group:

Groups may be granted access rights to all transactions within a specific resource type or to all transactions within every type. A resource is a data item such as a class, an attribute, or a document. A resource type represents a grouping of resources into a class of items. For example, a specific document falls into the resource type "RMWord Documents." Each resource type has transactions that are appropriate for that type of resource. Transactions represent what can be done with that resource. For instance, scripts may be created, read, updated, renamed and removed.

To grant access rights for every transaction within a single resource type:

1. Select **View** | **Projects**.
2. Select the project in the left-hand graphical tree for which you want to grant default access.
3. Click the **Default Access** tab.
4. Click + to expand the **Groups** folder.
5. Expand the group to see the types of resources that may be assigned default access.
6. Right-click the *resource type* you want to grant all access rights for and select **Grant All**. This sets all of the transactions in this resource type to be explicitly granted for this group.

To grant access rights for every transaction in every resource type:

1. Select **View** | **Projects**.
2. Select the project in the left-hand graphical tree for which you want to grant default access.
3. Click the **Default Access** tab.
4. Click + to expand the **Groups** folder.
5. Right-click the *group* you want to grant all access rights to and select **Grant All**. This sets all of the transactions in every resource type to be explicitly granted for this group.

Granting All Access Rights to a User:

Users may be explicitly granted access rights to all transactions within a specific resource type or to all transactions within every resource type. A resource is a data item such as a class, an attribute, or a document. A resource type represents a grouping of resources into a class of items. For example, a specific document falls into the type "RMWord

Documents". Each resource type has transactions that are appropriate for it. Transactions represent what can be done with that resource. For instance, scripts may be created, read, updated, renamed, and removed.

To grant access rights for every transaction within a single resource type:

1. Select **View** | **Projects**.
2. Select the project in the left-hand graphical tree for which you want to grant default access.
3. Click the **Default Access** tab.
4. Click + to expand the **Users** folder.
5. Expand the user to see the types of resources that may be assigned default access.
6. Right-click the *resource type* you want to grant all access rights for and select **Grant All**. This sets all of the transactions in this resource type to be explicitly granted for this user.

To grant access rights for every transaction in every resource type:

1. Select **View** | **Projects**.
2. Select the project in the left-hand graphical tree for which you want to grant default access.
3. Click the **Default Access** tab.
4. Click + to expand the **Users** folder.
5. Right-click the *user* to which you want to grant all access rights and select **Grant All**. This sets all of the transactions in every resource type to be explicitly granted for this user.

Revoking All

Groups may be denied access rights to all transactions within a specific resource type or to all transactions within every type. Users may be explicitly denied access rights to all transactions within a specific type or to all transactions within every type.

A resource is a data item such as a class, an attribute, or a document. A resource type represents a grouping of resources into a class of items. For example, a specific document falls into the type “RMWord Documents.” Each resource type has transactions that are appropriate for that type of resource. Transactions represent what can be done with that resource. For example, scripts may be created, read, updated, renamed, and removed.

To revoke access rights for every transaction within a single resource type:

1. Select **View** | **Projects**.
2. Select the project in the left-hand graphical tree for which you want to revoke default access.
3. Click the **Default Access** tab.
4. Click + to expand the **Groups** or **Users** folder.
5. Click + next to the relevant group or user to see the types of resources that may be assigned default access.

6 Right-click the *resource type* for which you want to revoke all access rights and select **Revoke All**. This sets all of the transactions in this resource type to be denied for this group or user.

7 When prompted, click **Yes** to confirm the revoke all action.

To revoke access rights for every transaction in every resource type:

1 Select **View** | **Projects**.

2 Select the project in the left-hand graphical tree for which you want to revoke default access.

3 Click the **Default Access** tab.

4 Click + to expand the **Groups** or **Users** folder.

5 Right-click the *group or user* for which you want to revoke all access rights and select **Revoke All**. This sets all of the transactions in every resource type to be denied for this group or user.

6 When prompted, click **Yes** to confirm the revoke all action.

Inheriting All Access Rights for a User

Users can inherit access from their groups for all transactions within a specific resource type or all transactions within all resource types. A resource is a data item such as a class, an attribute, or a document. A resource type represents a grouping of resources into a class of items. For example, a specific document falls into the type "RMWord Documents." Each resource type has transactions that are appropriate for that type of resource. Transactions represent what can be done with that resource. For instance, scripts may be created, read, updated, renamed and removed.

To grant access rights for every transaction within a single resource type:

1 Select **View** | **Projects**.

2 Select the project in the left-hand graphical tree for which you want to inherit default access.

3 Click the **Default Access** tab.

4 Click + to expand the **Users** folder.

5 Click + next to the relevant *user* to see the types of resources that may be assigned default access.

6 Right-click the *resource type* for which you want to inherit all access rights and select **Inherit All**. This sets all of the transactions in this resource type to be inherited for this user. The user does not have access rights explicitly granted or denied for any transaction in this resource type, but instead inherits his or her group access rights for these transactions.

7 When prompted, click **Yes** to confirm the inherit all action.

To grant access rights for every transaction in every resource type:

1 Select **View** | **Projects**.

2 Select the project in the left-hand graphical tree for which you want to inherit default access.

3 Click the **Default Access** tab.

4 Click + to expand the **Users** folder.

5 Right-click the *user* for whom you want to inherit all access rights and select **Inherit All**. This sets all of the transactions in every resource type to be inherited for this user. The user does have access rights explicitly granted or denied for any transaction, but instead inherits his or her group access rights.

6 Click **Yes** to confirm the inherit all action.

Assigning Categories

Permissions are assigned to categories through groups. Only users who are members of groups assigned to a category are able to view this category. The permissions for each category are determined by the permissions the user has from belonging to groups that are assigned to this category. The Administrators group always has permissions to all categories.

- The group column in the right-hand list allows you to grant a user access, deny a user access, or allow a user to inherit the access rights of his or her parent groups.
- The project column in the right-hand list shows the access that is provided from the project level. If this check box is selected, the group is explicitly allowed access to the category at the project level. It shows whether the group has full access at a global level. You cannot explicitly change this check box selection.
- The actual column in the right-hand list shows the effective access at the category level. It shows what the group rights are after you change them.

To assign permissions to categories:

1 Select **View** | **Projects**.

2 Select the project in the left-hand graphical tree for which you want to set default access.

3 Click the **Category Assignment** tab.

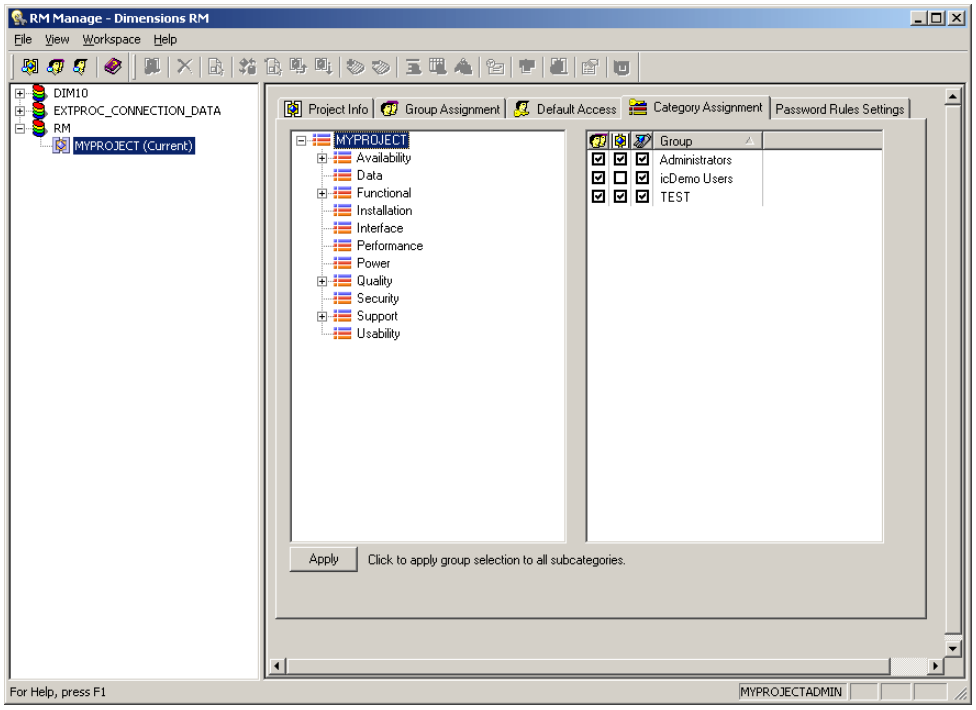


Figure 2-17. Category Assignment

4 In the tree in the left pane, select the category to which you want to assign permissions.

5 In the right pane, select the check box next to each group you want to assign permissions to this category.

6 If you want the group selection to apply to all subcategories, click **Apply** at the bottom of the tab.

Password Rules Settings Tab

The use of the **Password Rules Settings** tab is described in "Setting Password Rules" on page 109.

Deleting a User from a Project

Users cannot be deleted once assigned to a project through any group. Users must be unassigned from projects before being deleted from the database. Only project administrators can remove users from projects. The administrative user that is generated for a project cannot be deleted under any circumstances. Dimensions RM maintains this ID internally.

Managing Security

NOTES As a good general practice, Serena recommends that no Dimensions RM group or user (including Administrators) ever be granted the class access rights for: REMOVE, UPDATE, and UPDATE NON_CURRENT.

Update should not be granted to anyone on the system. All requirements changes should be performed with the replace function. This approach allows a fully auditable change history to be maintained and thus exposes Dimensions RM full capabilities. But this approach does require that you baseline requirements to capture the versions that you are currently capturing with the replace button. If users start using baselines and snapshots with other usage models (primarily updates and replace to version), they will be forced to create a new version just because someone else created a baseline. This may also limit the compare functions in Dimensions RM.

Group and user access rights are maintained within RM Manage. The administrator can assign default access to group and user accounts. For example, a user can be granted read-only privileges, but not be granted the ability to update data. In addition to granting specific privileges to users, the administrator can also allow a user to inherit rights from his or her groups. Users can be given access to more than one group and have different privileges for each. Therefore, a user can have specified privileges for different projects. The administrator can also grant or deny privileges at the group level.

Access rights are associated with each resource defined in a Dimensions RM database. Access rights determine whether a user can perform a particular task on a target resource. (A user refers to an Dimensions RM user, not an Oracle or Windows user.) This section describes the relationships between the various entities that represent users and their permissions and the various means used to manipulate permissions.

Default Access

Dimensions RM security is maintained by assigning access rights for groups and users. The administrator may assign default access to a group or user, thereby eliminating the need to assign access to each item that is created in the other tools. The default access may be overridden. Refer to Chapter 3, "Class Definition" on page 115, "Order of Precedence" on page 71, and the RM Explorer chapter in the *Serena Dimensions RM Windows Clients User's Guide* for information on overriding default access.

It is through group membership that a user is added to a project. Once the user has been assigned to a project, default access may be set for the groups, as well as for the individual user. Each group has two states for default access: granted or not granted. Each user has three states for default access: granted, revoked or inherited. The combination of the user default access as well as the default access for the groups that he or she has been assigned to through the project determines the default access for that user for the project.

For example, in the following illustration, the user has been assigned to Project `MYPROJECT` through a group that the user is a member of and has default **Read** and **Create** access granted for the **Scripts** resource type as a user, but does not have this access granted as a default for the associated group.

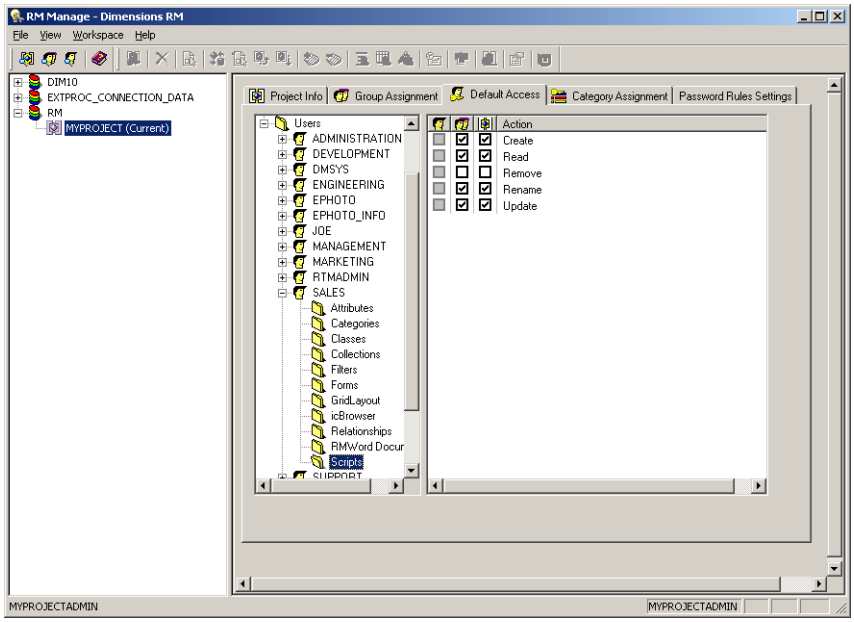


Figure 2-18. Default Script Access

The user's default access for **Scripts** shows that the **Create** and **Read** transactions are not selected in the group column . Those transactions have not been granted for the groups to which the user belongs. The user column represents the access that has been set for the user. The rows that are gray in the user column indicate that the user does not have any default access set for this transaction and will inherit the collective access of group. The rows that are unchecked ☐ indicate that the user has been explicitly denied default access for this transaction. The rows that are checked ☑ indicate that the user has been explicitly granted default access for this transaction.

The project column indicates the net effect of the user and group default access for the project. In this case, the user has **Read** and **Create** access for the resource type of *Scripts*.

Changing the Administrator Password

To change the administrator password:

1. Select the database for which you want to change the administrator password.
2. Select **File** | **Change User Password**, click the **Change User Password** button , or right-click the database and select **Change User Password**.
3. Enter a new password and confirmation password for the administrator.
4. Click **OK**.

Order of Precedence

The use of groups and the ability to explicitly allow and disallow users access to a resource make it possible that a user may be both allowed and denied access to a specific resource. To resolve this potential conflict into a simple Boolean condition or access right,

an order of precedence is used by Dimensions RM security from highest to lowest precedence:

Source of Access	Allowed Status
An individual user has been explicitly denied access to a resource/transaction.	Denied
An individual has been granted explicit access to a resource/ transaction.	Allowed
An individual has been granted access to a resource/transaction through membership in a group, which has been granted access.	Allowed
An individual has been explicitly denied access to an entire resource type through default access rights.	Denied
An individual has been explicitly allowed access to an entire resource type through default access rights.	Allowed
An individual has been allowed to an entire resource type through membership in a group, which has been granted access rights to a resource type.	Allowed
There exist no entries specifying access rights for the individual or any groups that the individual is a member of in the access rights list.	Denied

NOTE Even if the administrator denied certain users the Delete Baseline and Rename Baseline transactions, these users can delete and rename a baseline if they created the baseline. In this situation, the permissions that are denied by the administrator are overridden.

Valid Transactions

The valid transactions for Dimensions RM entities are listed in the following table.

Transaction	Definition
Attribute Transactions	
Read	The user can see the attribute value.
Update	The user can change the attribute value.
Category Transactions	
FullAccess	For users, for internal use only. For groups, the users in the group have project level permission to move or copy scripts, filters, and traceability reports into other categories, and move requirements between categories, even if they are not in a group that has permissions to the individual categories. For information about assigning groups permissions to individual categories, see "Assigning Categories" on page 68. **NOTE:** To add, delete, rename, or move categories, users must be in the Administrator's group. The FullAccess transaction has no effect on the ability to perform these actions.

Transaction	Definition
Class Transactions	
CMLock	The user can lock class objects for configuration management purposes.
Create	The user can create new class objects.
CreateCR	The user can create new change requests for class objects.
Delete	The user can mark class objects as deleted.
ExecuteCR	The user can accept or reject change requests.
Expand	The user can expand class objects.
Focus	The user can focus class objects.
Link	The user can create generic links to class objects.
Read	The user can read class objects.
Remove	The user can remove class objects.
Replace	The user can replace class objects.
Undelete	The user can undelete class objects.
Unlock	The user can unlock class objects.
Update	The user can update objects with a status of "Current."
UpdateNonCurrent	The user can update objects where the status is not "Current."
Container Transactions	
Link Requirement to Dimensions Project	The user can add a requirement to a container (including collection) that is associated with a Dimensions CM project.
Associate to a Dimensions Project	The user can associate a container (including collection) with a Dimensions CM project.
Collection Transactions	
Link Requirement to Dimensions Project	The user can add a requirement to a collection that is associated with a Dimensions CM project.
Associate to a Dimensions Project	The user can associate a collection with a Dimensions CM project.
Create	The user can create a new collection.
Create Baseline	The user can create a baseline from a collection.
Create Collection Based on Existing	The user can create a collection based on an existing collection.
Delete Baseline	The user can delete a baseline.
Link	The user can create links to collections.
Remove	The user can remove a collection.
Rename Baseline	The user can rename a baseline.
Unlock	The user can unlock collections that are not locked.
Update	The user can create/edit alias's and modify parent/child links for a collection.

Transaction	Definition
RMWord Document Transactions	
Capture	The user can capture class objects from RM Word documents.
Create	The user can register new RM Word documents.
Read	The user can see registered RM Word documents.
Remove	The user can unregister RM Word documents.
Unlock	The user can unlock RM Word documents that are not locked.
Filter Transactions	
Create	The user can create new filters.
Read	The user can see and execute filters.
Remove	The user can remove filters.
Update	The user can change filters.
Form Transactions	
Create	The user can create new class forms.
Read	The user can read class forms.
Remove	The user can remove class forms.
Rename	The user can rename class forms.
Update	The user can update class forms.
Grid Layout Transactions	
Create	The user can create new grid layouts.
Read	The user can see and use grid layouts.
icBrowser Transactions	
FullAccess	For internal use only.
Relationship Transactions	
Create	The user can create new links for relationships.
Delete	The user can delete links for relationships.
Modify	The user can change relationship attribute values.
Read	The user can look at relationship links.
Remove	The user can remove relationship links.
Undelete	The user can undelete relationship links.
Update	The user can update relationship links with a status of "Current."
Script Transactions	
Create	The user can create new scripts. **NOTE:** If you do not have Create permission, you can create a new script; however, you cannot save it.
Read	The user can see and execute scripts.

Transaction	Definition
Remove	The user can remove scripts.
Rename	The user can rename scripts.
Update	The user can change scripts.

Database Password Encryption

Database password encryption lets you control the password for the ICADMIN and ICPROJECTS Oracle users. This prevents unwanted personnel from connecting to the Serena-Supplied Runtime database or your own Oracle database to read and modify data.

To accomplish this, you use a file named `security.dat` that contains the password in an encrypted form. This file contains two lines. The first line is the security token that is used as the key to the encryption algorithm for how to encrypt and decrypt the password. The second line in the file is the encrypted password.

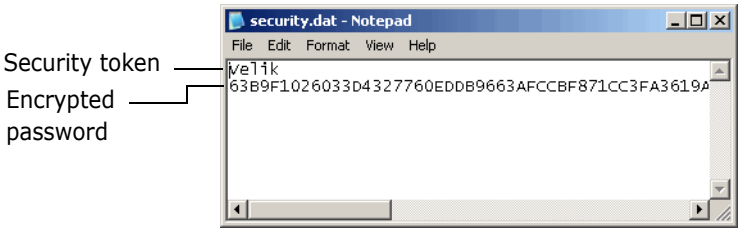


Figure 2-19. Default security.dat File

Changing the Location of the security.dat File

The default `security.dat` file is automatically installed in top-level of the Dimensions RM installation directory (`RTM_HOME`). You can change the default location during installation or move it to another location later. If you do so, each user must then use RM Manage or RM Explorer to specify its location.

NOTE If no `security.dat` file is found in the specified location, the default security token and password are used. These are the same security token and password that are in the default `security.dat` file that was installed.

For information about using RM Manage to specify the location of the `security.dat` file, see "Setting the Location of the Database Password File" on page 42. For information about using RM Explorer to specify the location, see the *Serena Dimensions RM Windows Clients User's Guide*.

Changing the Database Password Using the Convert Database Utility

To change the database password:

1. Run the RMEncrypt.exe application to generate the encrypted password value. To do so:
   - **a** Open a Windows the Command Prompt:

     Start | All Programs | Accessories | Command Prompt
   - **b** Navigate to the `<RM Install Dir>\bin` directory.

c Type the following command:

```
RMEncrypt.exe <new password>
```

A string of characters is displayed on the line after the command.

NOTES

- Any space before or after the password is ignored.
- Do not use quotation marks in the text to be encrypted unless they are part of the password.

2 To select all of the characters, double-click the string of characters.

3 From the menu on the title bar of the Command Prompt, select **Edit | Copy**.

4 To navigate back to the `RM` directory, type `'cd..'`.

5 Type the following command:

```
notepad security.dat
```

The `security.dat` file opens in Notepad.

6 Paste the string under the token in Notepad and delete the old string.

7 Open RM Manage.

8 Select the database, right-click and select **Convert Database**. The **Database Validation** dialog opens.

9 Select the database and then click **Upgrade**.

10 When prompted, enter the `ICDBA` password.

11 To start the upgrade, click **Continue**.

12 When prompted that the database is valid and whether you want to recreate the procedures, click **Yes**.

13 When the resources have been updated, click **Close**.

Changing the Security Token

To change the security token:

1 Open a Windows the Command Prompt:

Start | All Programs | Accessories | Command Prompt

2 From the Command Prompt, navigate to the `<RM Install Dir>\bin` directory.

3 Type the following command:

```
notepad security.dat
```

The `security.dat` file opens in Notepad.

4 Delete the existing security token and type the new one. Leave the Notepad file open.

NOTE The security token must be at least four characters long. If it is less than four characters long, the default security token is used.

5 Save the `security.dat` file.

6 Run the RMEncrypt.exe application to generate the encrypted password value. To do so:

   a Navigate in the Command Prompt to the `<RM Install Dir>\bin` directory.

   b Type the following command:

```
RMEncrypt.exe <new password>
```

   A string of characters is displayed on the line after the command.

7 Double-click the string of characters to select all of the characters.

8 From the menu on the title bar of the Command Prompt, select **Edit | Copy**.

9 Paste the string under the token in Notepad and delete the old string.

10 If you also changed the password, perform Step 7 through Step 13 under "Changing the Database Password Using the Convert Database Utility" on page 75.

11 Save the `security.dat` file.

Changing the Database Password Directly in Oracle

It is also possible to change the password for the ICADMIN and ICPROJECTS users in the Oracle database by directly using Oracle utilities.

IMPORTANT! Only technically expert users or DBAs should attempt to change the password using Oracle utilities.

Managing Databases

In the Dimensions RM environment, a database represents an instance of Oracle. The database can contain multiple Dimensions RM projects. The databases that are displayed are determined by the contents of the `tnsnames.ora` file.

Before you can access the projects contained in a database, you must first log on using a valid Dimensions RM user and password. Once you have been validated, the projects that you are able to administer will be available. The list of users and groups is defined once for a database and is shared across all projects contained within that database.

You can have any number of Dimensions RM projects in the Serena-Supplied Runtime RDBMS database or your own company's Oracle database. When you create a project, you can import data from a saved project or create a "blank" project. Dimensions RM allows you to choose the size of the tablespace datafile, which is a unit of storage where data is physically stored. You also can convert a database from a previous version of Dimensions RM.

Logging onto a Database

To log on to a database:

1 Click a database or expand the database folder.

The **Logon Information** dialog box opens.

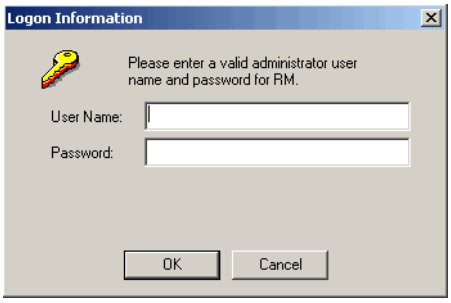


Figure 2-20. Logon Information

2 Enter an administrator user name and password.

3 Click **OK**.

Logging on as a Different User

To log on as a different user:

1 Select the database to which you want to log on.

2 Select **File** | **Change User**, click the **Change User** button , or right-click the database and select **Change User**.

3 Enter the new user name and password and click **OK**.

Converting a Database or Project

The conversion tool allows you to upgrade older versions of a Dimensions RM project database to the current version. If you upgrade Dimensions RM to take advantage of improved features, you must convert the database and projects.

This tool converts any Dimensions RM project database after version 3.7.2. If you have a version that predates 3.7.2, you must upgrade to at least 3.7.2 before the upgrade to the current version can take place.

For versions prior to version 5, any users who had access rights within the project or who were allowed access to the project will be given a login for the converted project. Administrators for the project must have administrator privileges for the converted project. Before you upgrade any project, perform a backup, see "Backing Up a Project Account" on page 47. The backup file should be kept in your archives.

During the upgrade, the project is incrementally converted until it gets to the current version. The last step may take some time while it generates stored procedures within the project area and then creates users and their access rights for that project.

Pre-existing user accounts with access to the project or access rights within the project will be created in the new converted database. Pre-existing users will have unknown last

names and will need to be modified manually using RM Manage after the upgrade has completed. Any administrator for the project will be able to administer the project when logging on. In addition to existing administrators, pre-existing user profiles will be generated with the name `<project>Admin` (for example, `SECURITYAdmin`).

To convert a database or project:

1. Select the database that contains the project you want to convert.
2. Select **File** | **Convert Database**, click the **Convert Database** button , or right-click the database and select **Convert Database**. This starts the conversion tool.

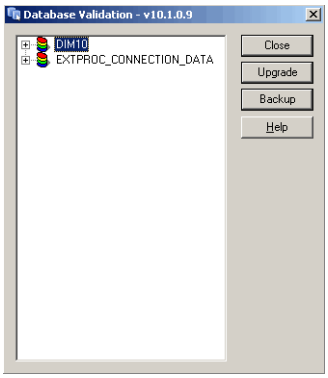


Figure 2-21. Database Validation

3. To expand the database that contains the project you want to convert, click +.
4. Enter the `ICDBA` password.
5. Select the project and click **Upgrade**.
6. To start the upgrade, click **Continue**. The upgrade may take several minutes to complete.

NOTES

- The Document View perspective in RM Browser requires title and description attributes. When you upgrade a project that does not have a title and description attribute set for each class, a message is displayed that informs you that the upgrade process will add attributes if no existing attributes are acceptable.

  After you upgrade, review each class and class type and, if necessary, select or create more appropriate attributes to use for the title and description.

  The upgrade process could select an implicit attribute such as *Created by* for the title or description attribute. If a Class Definition diagram includes an implicit attribute for the title or description attribute, you must change the attribute to a user-defined attribute, or you will be unable to save the Class Definition diagram. If an appropriate user-defined attribute does not exist, you must create one.

  For information about setting the title and description attributes, see "Specifying Attributes" on page 139. For more information about Document View, see the *Serena Dimensions RM Browser User's Guide*.

- The upgrade process detects any non-unique attribute name and prompts you for a new name. For example, the upgrade process prompts you for a new name for a user-defined attribute named *Category* and changes the attribute name to the new name. This is done to prevent a conflict with a user-defined attribute named *Category* and the implicit attribute named *Category*.

7 When the resources have been updated, click **Close** to exit the conversion tool.

Administering Tablespaces

A tablespace is a logical storage unit. Each project is physically stored in one or more data files associated with a tablespace. Initially, only one file is associated with the tablespace, but you can add more files as you need them.

The size of the tablespace is determined by the size of the data file or combined data files that make up the tablespace.

Creating a Tablespace

To create a tablespace:

1 Select the database in which you would like to create a tablespace.

2 Select **File** | **Administer Tablespaces**, click the **Administer Tablespaces** button , or right-click the database and select **Administer Tablespaces**.

3 If prompted, enter the `ICDBA` password and click **OK**.

The **Administer Tablespaces** dialog box opens.

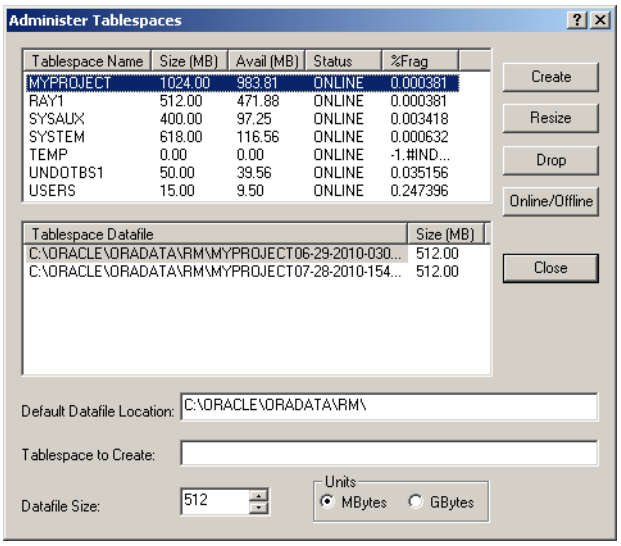


Figure 2-22. Administer Tablespaces

4 Enter a name in **Tablespace to Create** for the tablespace.

5 In the **Datafile Size** field, enter or select a datafile size.

6 Select a unit for the size. You can choose megabytes or gigabytes.

7 Click **Create**.

Dropping a Tablespace

When you drop a tablespace, the tablespace and all data in it are deleted.

To drop a tablespace:

1 Select the database in which you would like to drop a tablespace.

2 Select **File** | **Administer Tablespaces**, click the **Administer Tablespaces** button , or right-click the database and select **Administer Tablespaces**.

3 If prompted, enter the `ICDBA` password and click **OK**. The **Administer Tablespaces** dialog opens.

4 Select the tablespace you want to drop from the top list.

5 Click **Drop**.

6 Click **Yes** to confirm the deletion when prompted.

Resizing a Tablespace

You can resize a tablespace when you are running low on available space. In general, you should consider increasing tablespace when available space is about 5 MB. How much you resize the tablespace varies, depending how much work you intend to do, how much disk space is available, and at what stage you are in your project.

To resize a tablespace:

1 Select the database in which you would like to resize a tablespace.

2 Select **File** | **Administer Tablespaces**, click the **Administer Tablespaces** button , or right-click the database and select **Administer Tablespaces**.

3 If prompted, enter the `ICDBA` password and click **OK**. The **Administer Tablespaces** dialog box opens.

4 Select a tablespace in the top list.

5 If you want to resize an existing tablespace file, select the file in the bottom list. If you want to create another tablespace file, do not select anything in the bottom list.

6 Click **Resize**. You will be asked if you want to resize an existing tablespace file. Select **Yes** if you want to resize an existing tablespace file; otherwise a new tablespace file will be created.

Placing a Tablespace Online or Offline

To place a tablespace online:

1 Select the database which you would like to place online or offline.

2 Select **File** | **Administer Tablespaces**, click the **Administer Tablespaces** button , or right-click the database and select **Administer Tablespaces**.

3 If prompted, enter the `ICDBA` password and click **OK**. The **Administer Tablespaces** dialog box opens.

4 Select an offline or online tablespace in the top list.

5 If you want to place the tablespace online, select the file in the bottom list. If you want to create another tablespace file, do not select anything in the bottom list.

6 Click **Online/Offline**.

Setting Default Location for Tablespace

To set the default location for a tablespace:

1 Select the database in which you would like to set a default tablespace location.

2 Select **File** | **Administer Tablespaces**, click the **Administer Tablespaces** button , or right-click and select **Administer Tablespaces**.

3 If prompted, enter the `ICDBA` password. The **Administer Tablespaces** dialog box opens.

4 Enter a location in the **Default Datafile Location** box.

Managing Locks

Dimensions RM classes, objects, collections, and source documents are implemented as sets of values within database tables. The set of values that defines a single object or collection is referred to as a *record*. When records are locked, they cannot be modified. RM Manage locks objects in use, such as documents opened by users. However, open records may remain locked after a system crash. Lock management is provided as a means of freeing records that have been locked as a result of a system crash.

It is also desirable to lock records temporarily to prevent others from changing the contents while some other action takes place. Lock management also provides a configuration management lock (CMLock), which is a way to lock records that should not be changed.

For security, only those records that are locked by the current user will be available to unlock; or, if the current user has been granted Unlock privileges, all of the user locked records will be available to unlock. Only users who have been granted CMLock privileges will be allowed to lock records for CM purposes. Only users who have been granted CMLock privileges will be allowed to unlock CM locked records.

NOTE You cannot use CMLock to unlock objects that are baselined.

Locking Objects

Use CM Lock when you want to keep an object from being modified. CM Lock can be used only for objects.

To lock objects:

1. Select a project.
2. Select **File** | **Administer Locks**, click the **Administer Locks** button , or right-click a project and select **Administer Locks**.

   The **Lock Manager** dialog box opens.

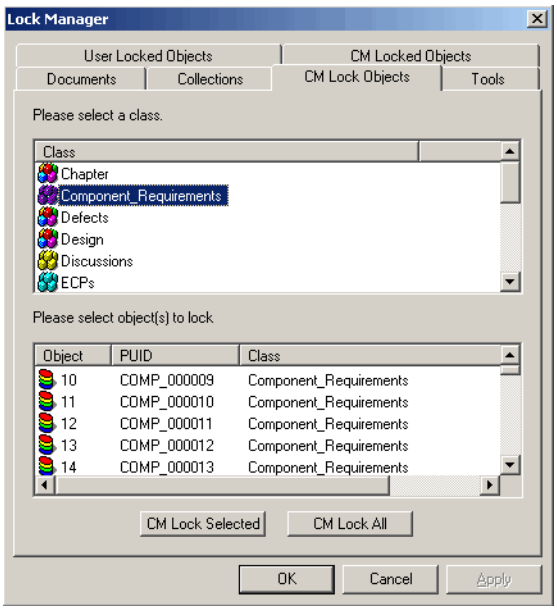


Figure 2-23. Lock Manager

3. Click the **CM Lock Objects** tab.
4. Select a class from the class list.
5. Select the objects you want to lock from the object list.

6 Click **CM Lock Selected** to lock only the selected objects, or **CM Lock All** to lock all of the objects for the selected class.

Unlocking Collections

To unlock collections:

1 Select a project.

2 Select **File** | **Administer Locks** or click the button. The **Lock Manager** dialog box opens.

3 Click the **Collections** tab.

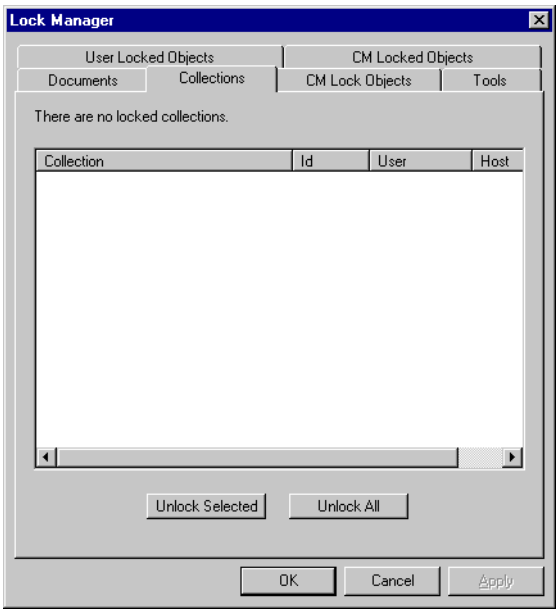


Figure 2-24. Lock Manager—Collections Tab

4 Select the locked collections you want to unlock from the list. Locked collections are indicated by a icon.

5 Do one of the following:

- Click **Unlock Selected** to unlock only the selected collections or **Unlock All** to unlock all the locked collections.
- Right-click and select **Unlock**.

Unlocking Documents

To unlock documents:

1 Select a project.

2 Select **File** | **Administer Locks** or click the button. The **Lock Manager** dialog box opens.

3 Click the **Documents** tab.

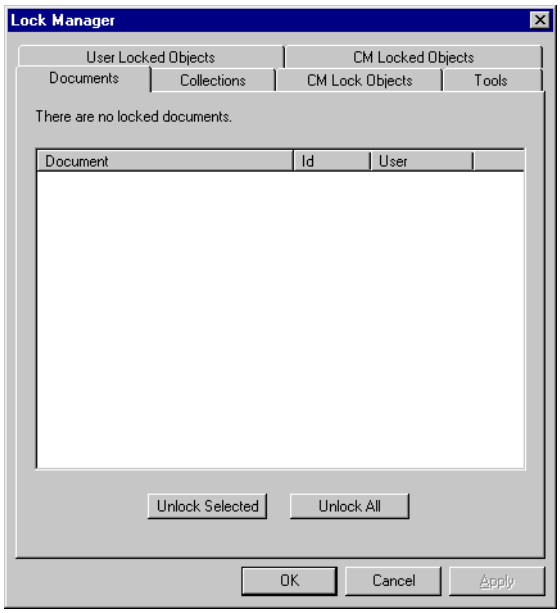


Figure 2-25. Lock Manager—Documents Tab

4 Select the locked documents you want to unlock from the list. Locked documents are indicated by a icon.

5 Do one of the following:

- Click **Unlock Selected** to unlock only the selected documents or **Unlock All** to unlock all of the locked documents.
- Right-click and select **Unlock**.

Unlocking Objects

To unlock objects:

1 Select a project.

2 Select **File** | **Administer Locks** or click the button. The **Lock Manager** dialog box opens.

3 Click the **CM Locked Objects** tab.

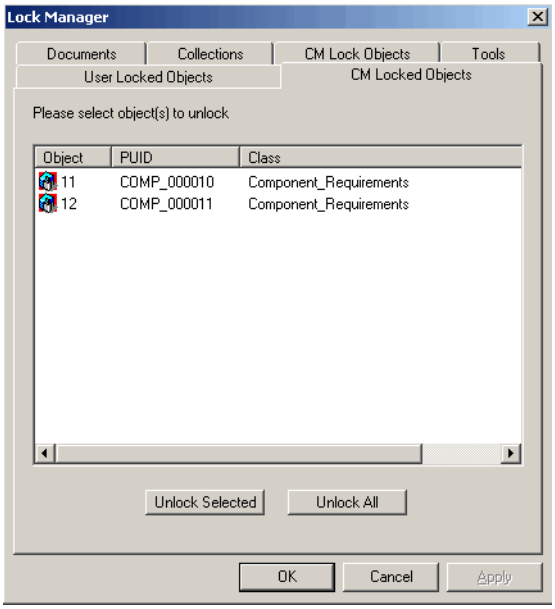


Figure 2-26. Lock Manager—CM Locked Objects Tab

4 Select the locked objects you want to unlock from the list. Locked objects are indicated by an icon.

5 Do one of the following:

- Click **Unlock Selected** to unlock only the selected objects or **Unlock All** to unlock all of the locked objects.
- Right-click and select **Unlock**.

Unlocking Tools

To unlock tools:

1 Select a project.

2 Select **File** | **Administer Locks** or click the button. The **Lock Manager** dialog box opens.

3 Click the **Tools** tab.

4 Select the tools you want to unlock from the tool list.

5 Click **Unlock Selected** to unlock only the selected tools or **Unlock All** to unlock all of the locked tools.

E-mail Registration

The project administrator can administer e-mail rules on a project-by-project basis. This section contains information on configuring e-mail messages and rules, and creating, modifying, and deleting rules.

Configuring E-Mail Messages and Rules

You can configure the following items from the **E-Mail Registration** dialog box:

- **Classes**—Individual classes can be enabled and disabled, thereby providing a simple method of disabling all rules that have been defined for a specific class.
- **Display Attributes**—A list of attributes that should be included in all e-mails can be specified. Each user can defined their own set of attributes to be included in the e-mail that will be inserted after the administrator-defined attributes.
- **Message Text**—A paragraph of pre- and post-message text can be defined. The pre-message text will be inserted at the start of the e-mail message, and the post-message text will be inserted at the end.
- **Subject Text**—The subject line for the e-mail can be defined. Attribute values can be included in the subject line.
- **Users**—Rules for all users can be administered in a single place. Rules can be created, modified and deleted for any user.

Enabling and Disabling Classes

You can define which class or classes should be enabled for e-mail notification. The RM Mail service only processes rules for classes that have been enabled.

You typically want to temporarily disable e-mail notification for a class while performing a large update operation, such as a batch update. Disabling e-mail notification for a class does not delete the rules that have been defined for the class; it simply suppresses the processing of rules for the class.

To enable or disable e-mail notification for a class:

1. Right-click the project, and select **Administer Email**. The **E-Mail Registration** dialog box opens.
2. Select the **Classes** branch.

   A list of all classes for the project is displayed in the right part of the dialog. Classes that are enabled have a checkmark in the check box next to them, while classes that are disabled have an empty check box next to them.

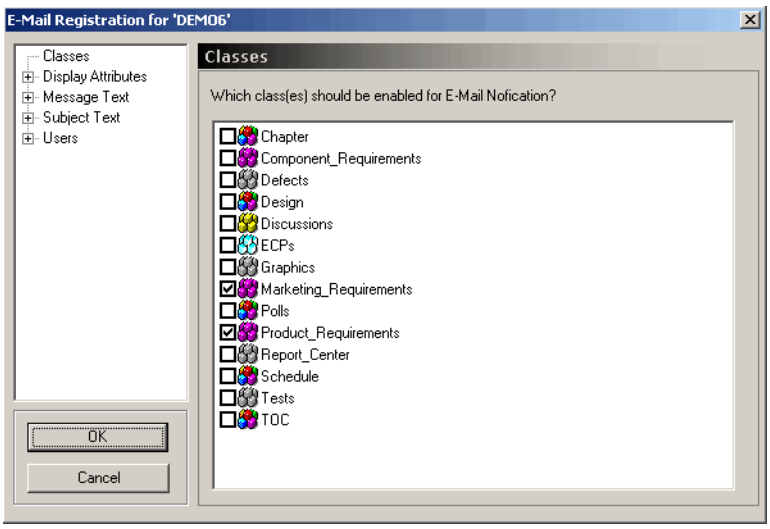


Figure 2-27. E-Mail Registration—Classes

3 Select the check box to the left of the desired class to enable or disable e-mail notification for it.

Defining Display Attributes

You can define a list of attributes that should be included with all e-mails sent for a specific class.

You can include a default set of attributes for all classes that do not have a specific set of attributes defined. The values for the administrator-defined attributes will be included in the e-mail prior to the attributes that the user selects to display when creating a rule.

To define which attributes should be included:

1 Right-click the project, and select **Administer Email**. The **E-Mail Registration** dialog box opens.

2 Expand the **Display Attributes** branch in the left-hand graphical tree and select the desired class.

On the right, two lists are displayed: the left list contains a list of attributes that will not be included with the e-mail, while the list on the right displays a list of attributes that will be included.

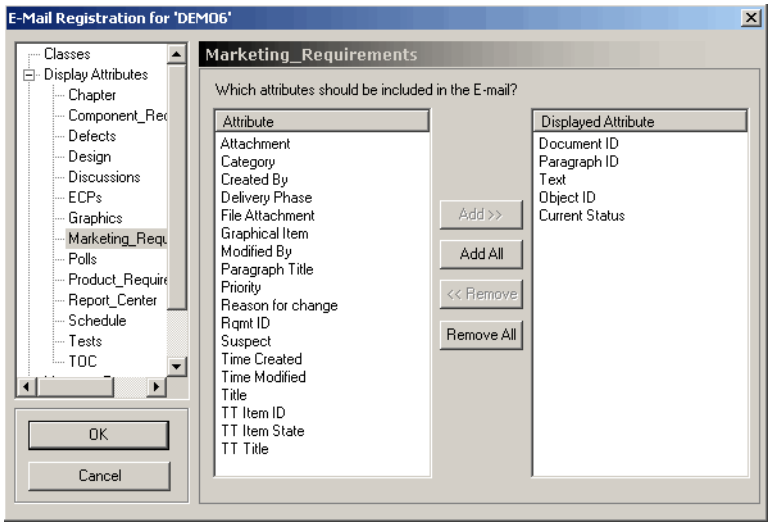


Figure 2-28. E-Mail Registration—Display Attributes

3 Select the attribute in either list and click **Add** or **Remove**.

To change the order of attributes:

- Drag-and-drop the attributes in the **Displayed Attribute** list to the desired order.

To define a default set of attributes:

1 Select the **Displayed Attributes** branch.

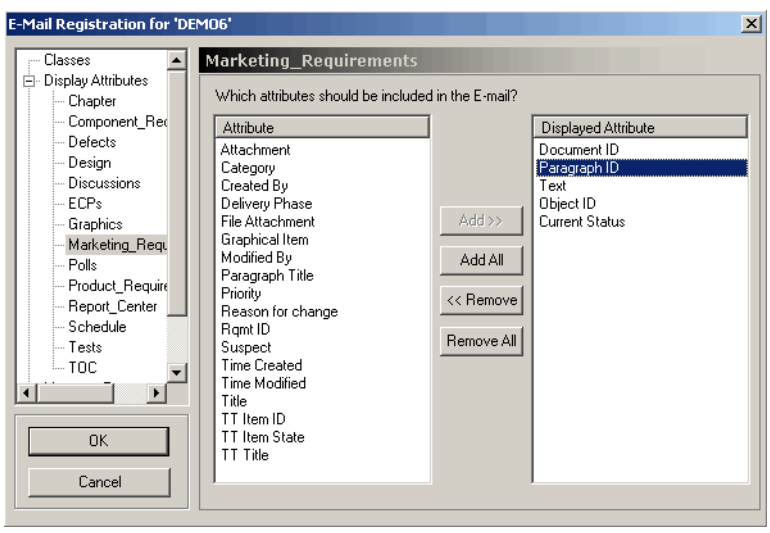


Figure 2-29. E-Mail Registration—Default Attributes

2 Add or remove attributes as described earlier in this section.

Defining Message Text

You can define a block of pre- and post-message text for each class. The pre- and post-message text is included with all e-mails generated by rules for the class. The pre-message text is included as the very first item in the e-mail while the post-message text will be included as the last item in the e-mail.

You can include a default pre- and post-message for all classes that do not have specific pre-message or post-message text defined.

To define pre-message and post-message text:

1 Expand the **Message Text** branch and select the appropriate class.

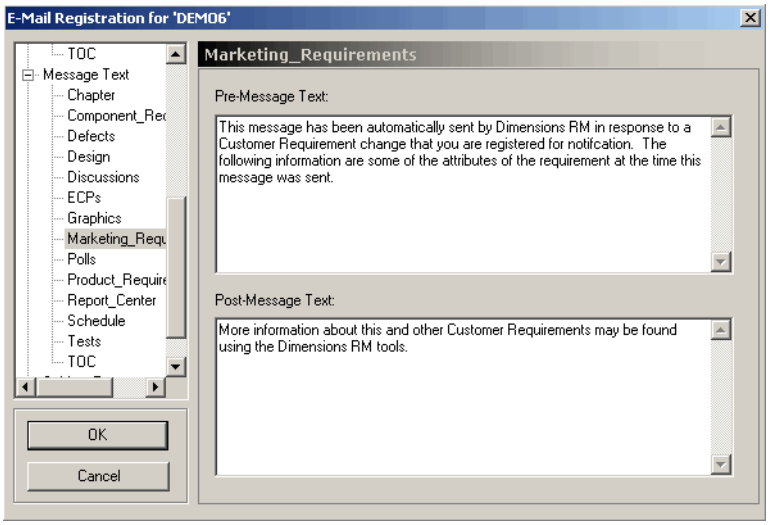


Figure 2-30. E-Mail Registration—Message Text

2 Enter the pre-message and post-message text into the appropriate field in the right pane.

NOTE Attribute values cannot be included in this text.

To define default pre-message and post-message text:

1 Select the **Message Text** branch.

2 Enter text as described earlier in this section.

Defining the Subject Text

You can define a the text that goes into the subject line for the e-mail for each class. The subject text can contain placeholders for attribute values that will be expanded before the e-mail is sent. Default subject text can be defined for all classes that do not have a specific subject line.

To define subject text:

1 Expand the **Subject Text** branch and select the appropriate class.

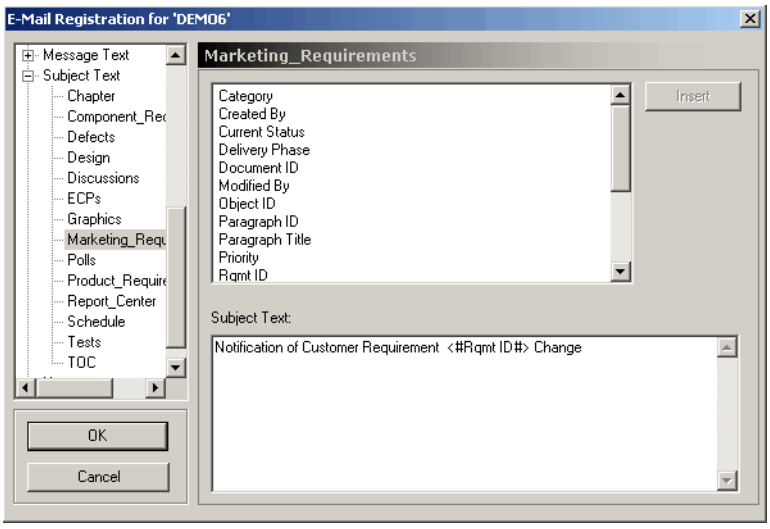


Figure 2-31. E-Mail Registration—Subject Text

2 Type the subject text.

3 To include an attribute value in the subject line, either select the desired attribute from the list shown above the subject text and click **Insert** or type the attribute's display name into the string surrounded by the strings <# and #>.

To define default subject text:

1 Select the **Subject Text** branch.

2 Enter the subject text as described earlier in this section.

Enabling User Rules

You can define which users have e-mail notifications enabled. The RM Mail service only processes rules for users that have e-mail notification.

You typically disable e-mail notification temporarily for users while they are on vacation. Disabling e-mail notification for a user does not delete the rules that have been defined by the user. It simply suppresses the processing of rules for the user.

To enable or disable e-mail notification for a user:

1 Expand the **Users** branch.

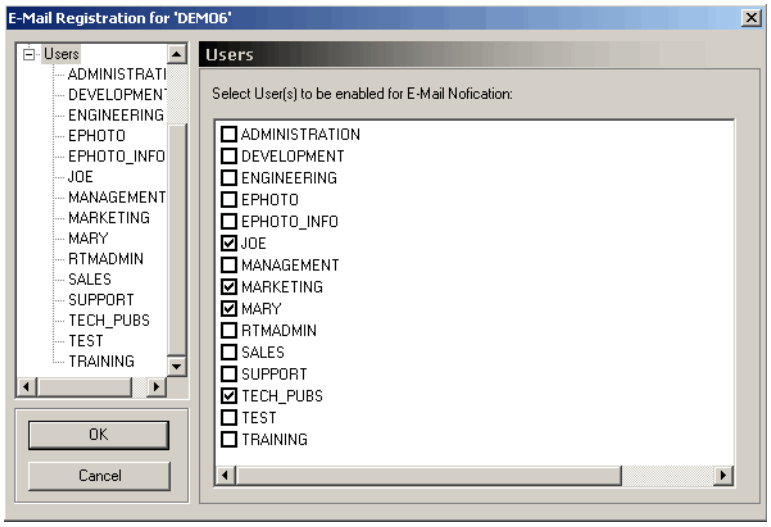


Figure 2-32. E-Mail Registration—Enabling User Rules

User rules that are enabled have a selected check mark next to them, and user rules that are disabled have a cleared check box next to them.

2 Select the check box to the left of the user to enable or disable e-mail notification.

Editing User Rules

The project administrator has access to the rules created by all users. As a result, the administrator can add, modify, or delete rules for any users that have been assigned to the project.

To edit user rules:

1 Expand the **Users** branch and select a user.

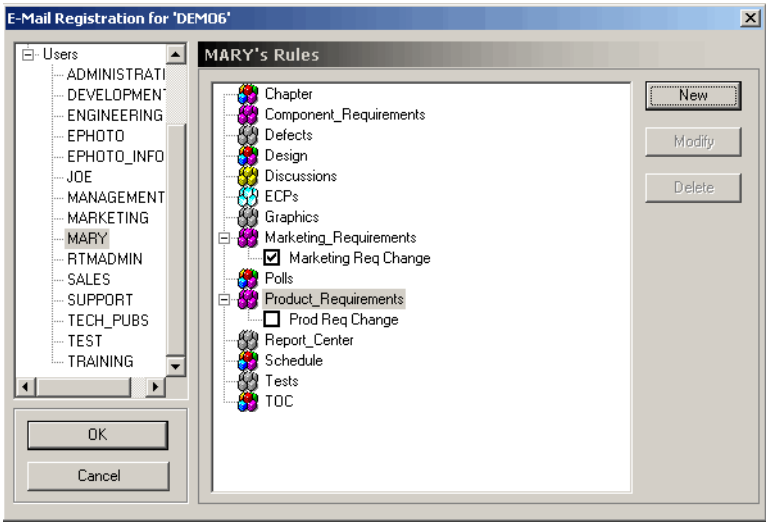


Figure 2-33. E-Mail Registration—Editing User Rules

The right pane will show a list of all classes that can be expanded to show the rules that have been created for the class. Rules that are enabled have a selected check

box next to them, while rules that are disabled have a cleared check box next to them.

2 Click the check box to the left of the desired rule to enable or disable rules.

Creating a Rule

The following sections describe the E-Mail Rules wizard, which guides you through the creation of a new rule.

To start the wizard:

1 In the **E-Mail Registration** dialog box, select the class for which the rule should be created.

2 Click **New**.

Naming the Rule

Each rule that is created must have a descriptive name associated with it that is displayed in the tree control. To name a rule:

1 Provide the name for the rule in the **What should the rule be called?** field of the **E-Mail Rules Wizard**.

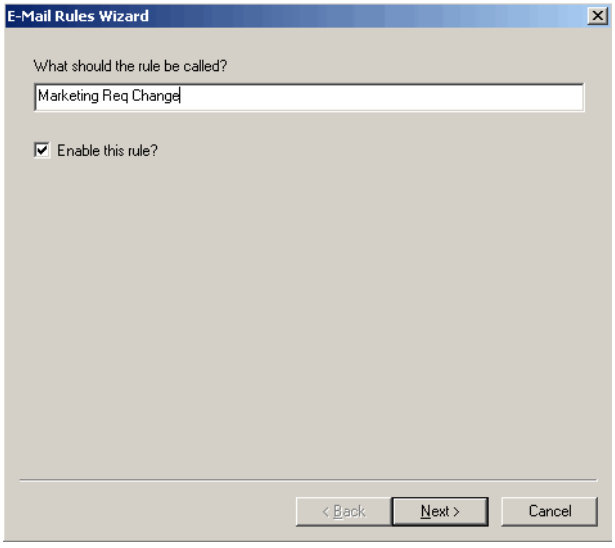


Figure 2-34. E-Mail Rules Wizard—Name

2 Configure whether the rule should be initially enabled or disabled.

Defining the Trigger Condition

The second step of creating a new rule is to define the triggering condition for when the e-mail should be sent:

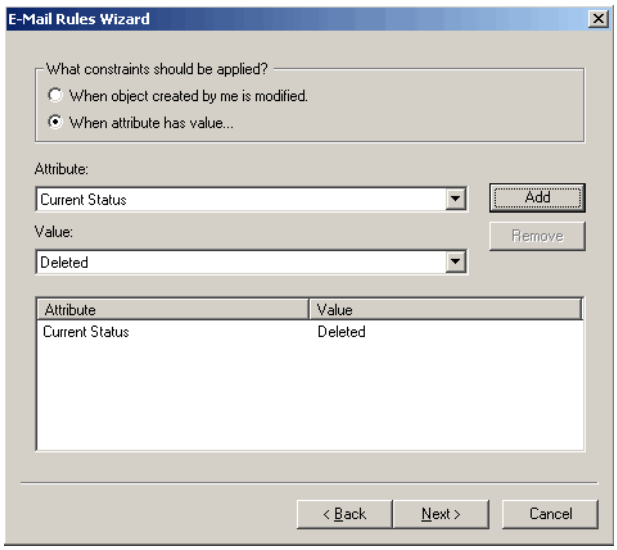


Figure 2-35. E-Mail Rules Wizard—Triggers

The triggering conditions falls into the following two broad categories:

- **When an object created by me is modified**

  Choose this option if you want to be notified whenever an object that you create has been changed. This will trigger an e-mail to be sent to you regardless of the change. If this option is selected, the remainder of the items on the page are hidden because they are no longer applicable.

- **When attribute has value...**

  Choose this option to specify that an e-mail should only be sent if the specified set of constraints are met. To add constraints, select the attribute from the **Attribute** drop-down menu and select the value that the object must have before an e-mail is sent from the **Value** drop-down menu. Multiple constraints can be added and these constraints are totaled to determine if an e-mail should be sent. Constraints can only be added to list attributes.

Defining the Attributes to be Monitored

If you selected **When attribute has value ...** in the previous step, you must determine which attribute should be monitored for a change in value. The mail service only processes a rule if the values change for attributes selected in this step.

This page of the **E-Mail Rules Wizard** is not displayed if you selected **When object created by me is modified** in the previous step, because an e-mail is sent regardless of which attributes change.

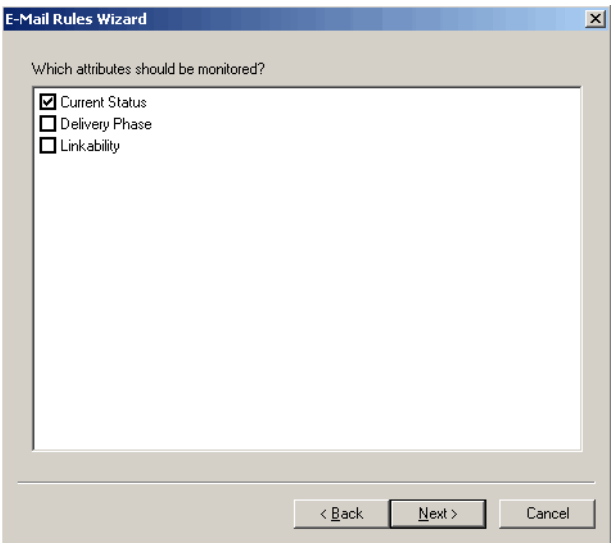


Figure 2-36. E-Mail Rules Wizard—Attribute Definition

Selecting the Attribute to Include in the E-Mail

Finally, you need to determine which attributes to include in the e-mail. The list on the left contains a list of attributes that will not be included with the e-mail, while the list on the right displays a list of attributes that will be included.

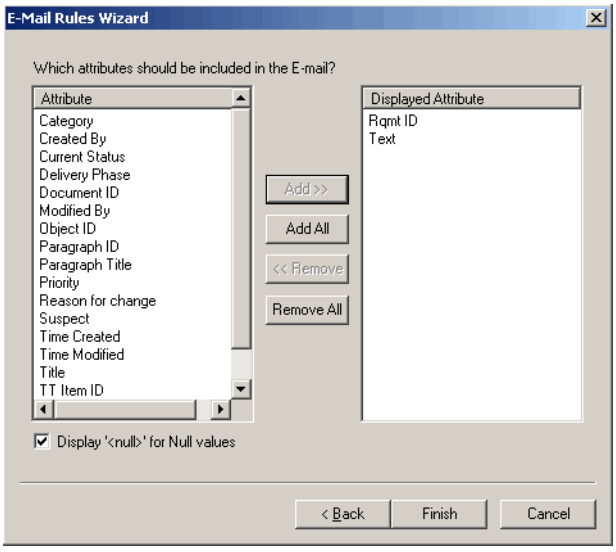


Figure 2-37. E-Mail Rules Wizard—Attribute Selection

To add an attribute to the list of attributes included with the e-mail, either double-click the attribute in the left hand list or select the attribute and click **Add**. To remove an attribute from the list of attributes included with the e-mail, either double-click the attribute in the right list or select the attribute and click **Remove**.

Dragging and dropping the attributes in the **Displayed Attribute** list changes the order in which the attributes are included in the e-mail. Note that the attributes are included in the e-mail in the order they appear in the **Displayed Attribute** list.

The values for the administrator-defined attributes will be included in the e-mail prior to the attributes that you select to display when creating a rule.

If the **Display <null> for Null values** check box is selected, the string "<Null>" is included next to the attribute display name in the e-mail if the attribute does not have a value assigned to it. If it is not selected, nothing will be displayed after the attribute display name.

Modifying a Rule for a User

To modify a rule for a user:

1. Expand the users branch.
2. Select the user.
3. In the right-hand pane, expand the class for which the rule is defined.
4. Select the rule.
5. To run the **E-Mail Rules Wizard**, click **Modify**.

Deleting a Rule for a User

To delete a rule for a user:

1. Expand the users branch.
2. Select the user.
3. In the right hand pane, expand the class for which the rule is defined.
4. Select the rule.
5. Click **Delete**.

RM Mail Service

The RM Mail service is designed to provide an automated mechanism for sending e-mail to registered users when a user-defined set or criteria is matched by an object in the database. The functionality is implemented in three different segments:

- **NT Service**—At least one Windows machine on the network must be configured to run the RM Mail service. RM Mail monitors the selected projects and dispatches e-mails as the specified criteria are met. Note that a single instance of RM Mail can monitor multiple projects on multiple database locations. In order to install the RM Mail server components, you must perform a custom installation and install the *RM Mail* component.
- **Configuration Panel Applet**—The system on which RM Mail is installed has a Windows applet that is used to configure the various aspects of the mail service.
- **Rule Configuration**—Project administrators and users must configure the e-mail rules processed by RM Mail.

NOTE Some e-mail clients modify the formatting of incoming e-mail messages by removing what they consider "extra" formatting. To prevent this, disable the options in your e-mail client that cause this modification.

To configure the RM Mail service:

1. Select **Programs | Serena | Dimensions RM *version* | RM Mail Configuration** from the Windows **Start** menu. The RM Mail configuration applet starts.

   The **RM Mail** dialog box has five tabs:

   - **Database**—Used to select the database location and projects that the mail service should monitor (see "Database Tab" on page 98).
   - **Mail Service**—Used to specify the name of the SMTP mail server to be used for sending mail, as well as the name and e-mail address from which the e-mail should be sent (see "Mail Server Tab" on page 98).
   - **Control**—Used to start and stop the e-mail service, as well as specify the interval at which the service should run (see "Control Tab" on page 99).
   - **Log**—Used to configure the amount of log information that is appended to the system application log (see "Log Tab" on page 101).
   - **General**—Used to specify the RM Browser URL for RM Mail service (see "Log Tab" on page 101).

2. Specify RM mail settings.

3. Click **Apply**.

4. Stop and then restart the **Serena Dimensions RM E-Mail Service** service.

   This can be done from the following locations:

   - RM Mail **Control** tab (see "Control Tab" on page 99)
   - Windows **Services** (from the Windows **Control Panel**, double-click **Administrative Tools** and then double-click **Services**).

Database Tab

Initially, the list of projects will be blank until a database location is selected from the **Database Location** drop-down list. When a database location is selected, a list of all Dimensions RM projects resident at that location is displayed.

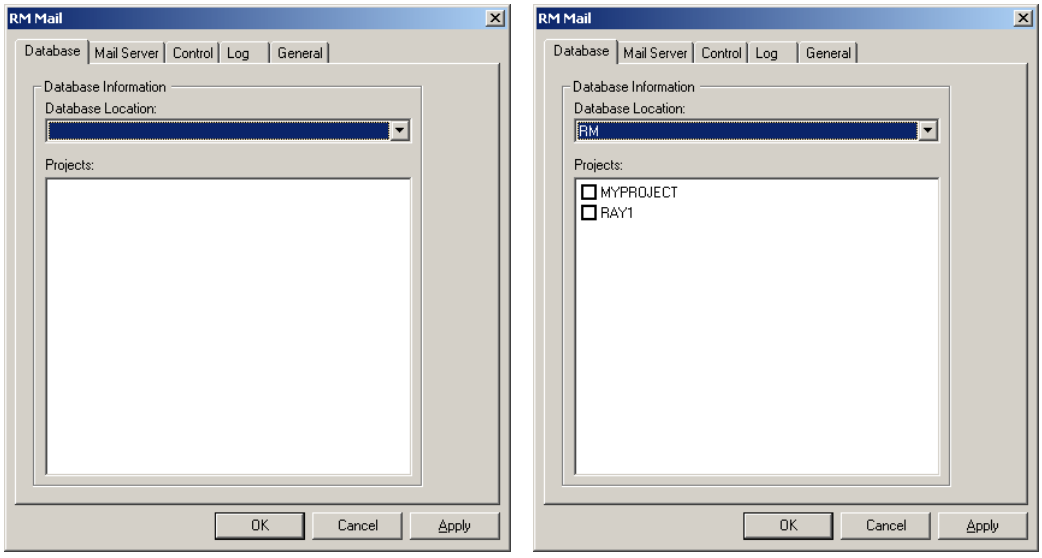


Figure 2-38. RM Mail—Database Tab

In the check box next to each project, select the projects this service should monitor. The mail service can monitor multiple projects at many locations.

Disabling e-mail notifications for a project does not delete the rules that have been defined for the project. It simply informs the RM Mail service to ignore them. You typically disable notifications when performing tasks such as batch updates.

Mail Server Tab

For the RM Mail service to send e-mail, it must have access to an SMTP mail server that has already been set up on the network. Enter the name of the system on which the SMTP mail server is installed in the **Server Name (SMTP)** field. In the **Server Port** field, enter the port that is used to communicate with the mail server. This defaults to 25 and is the normal port that the mail server uses.

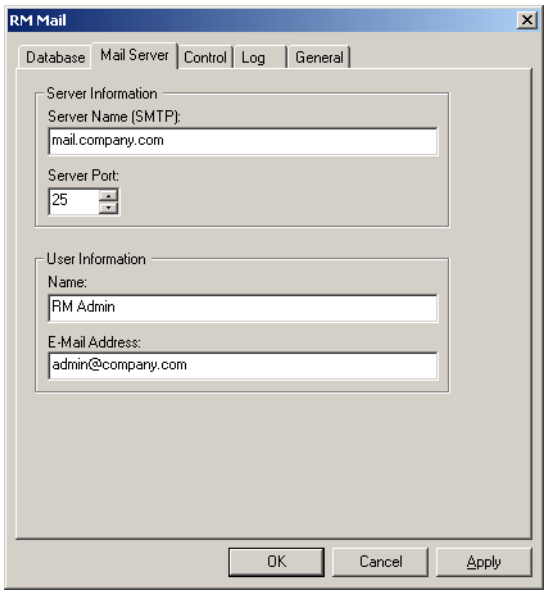


Figure 2-39. RM Mail—Mail Server Tab

Additionally, you can specify a name and e-mail address that is displayed in the "From" field in the e-mail. Ideally, this information is for a project administrator for the site. If you do not want users to reply to the e-mail, leave these fields blank. (Not all e-mail servers allow a blank e-mail address in the "From" field.)

Control Tab

The control tab provides a simple way to control the status of the RM Mail service.

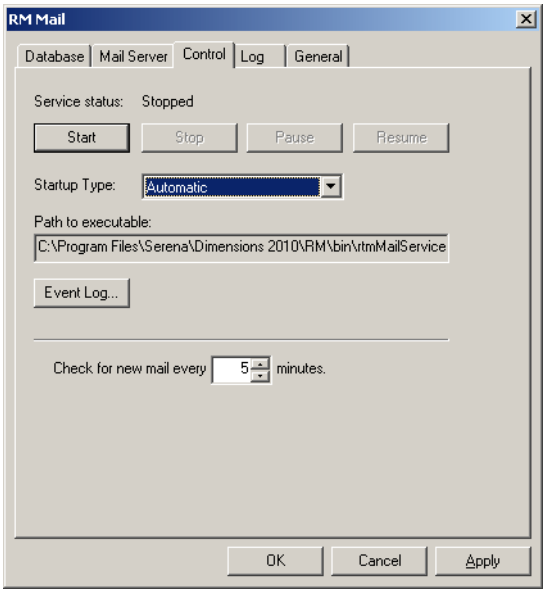


Figure 2-40. RM Mail—Control Tab

The current status of the service is displayed at the top of the dialog box.

To save changes made to the configuration before starting the RM Mail service, click **Apply**. To start the service, click **Start**. To stop the service, click **Stop**.

The **Startup Type** drop-down list provides three options:

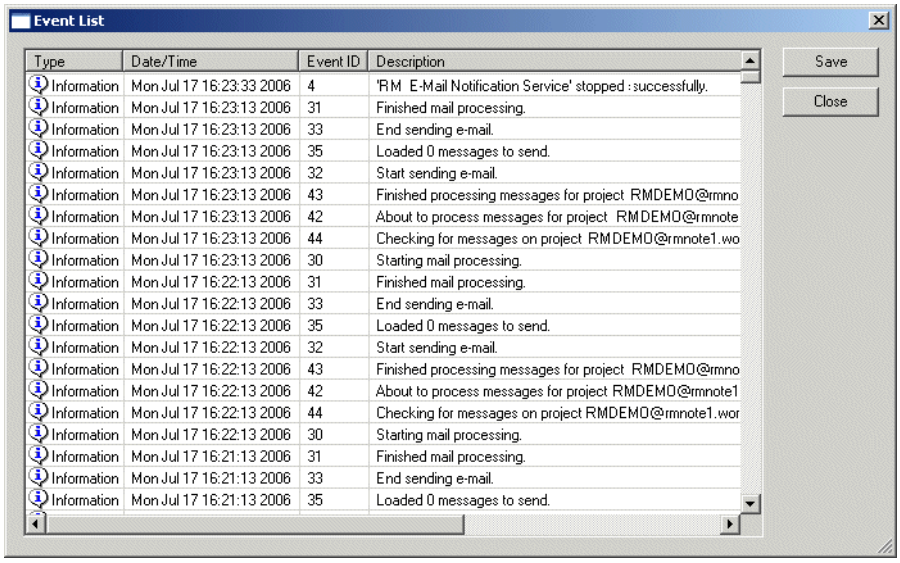
- **Automatic**—The service is started automatically at system boot time.
- **Manual**—The user must start the service manually, either from the RTM Mail Configuration applet or the Services applet on the control panel.
- **Disabled**—The service cannot be started either automatically or manually.

NOTE The service can also started and stopped from Windows **Services** (from the Windows **Control Panel**, double-click **Administrative Tools**, and then double-click **Services**.

The interval at which the mail service should process the e-mail rules can be selected by changing the value for the **Check for New E-mail** field. The default value for this field is 5 minutes, although the actual value used depends on the number of changes being made to the project data and maximum acceptable delay between a change occurring and the e-mail being sent. Generally, the more operations that are being performed on the data, the shorter the interval should be.

The path to the *rtmMailService.exe* executable is provided for reference.

Click **Event Log** to view a list of events that have been logged by the RM Mail service.



Type	Date/Time	Event ID	Description
Information	Mon Jul 17 16:23:33 2006	4	'RM E-Mail Notification Service' stopped : successfully.
Information	Mon Jul 17 16:23:13 2006	31	Finished mail processing.
Information	Mon Jul 17 16:23:13 2006	33	End sending e-mail.
Information	Mon Jul 17 16:23:13 2006	35	Loaded 0 messages to send.
Information	Mon Jul 17 16:23:13 2006	32	Start sending e-mail.
Information	Mon Jul 17 16:23:13 2006	43	Finished processing messages for project RMDEMO@rmno
Information	Mon Jul 17 16:23:13 2006	42	About to process messages for project RMDEMO@rmnote
Information	Mon Jul 17 16:23:13 2006	44	Checking for messages on project RMDEMO@rmnote1.wo
Information	Mon Jul 17 16:23:13 2006	30	Starting mail processing.
Information	Mon Jul 17 16:22:13 2006	31	Finished mail processing.
Information	Mon Jul 17 16:22:13 2006	33	End sending e-mail.
Information	Mon Jul 17 16:22:13 2006	35	Loaded 0 messages to send.
Information	Mon Jul 17 16:22:13 2006	32	Start sending e-mail.
Information	Mon Jul 17 16:22:13 2006	43	Finished processing messages for project RMDEMO@rmno
Information	Mon Jul 17 16:22:13 2006	42	About to process messages for project RMDEMO@rmnote1
Information	Mon Jul 17 16:22:13 2006	44	Checking for messages on project RMDEMO@rmnote1.wor
Information	Mon Jul 17 16:22:13 2006	30	Starting mail processing.
Information	Mon Jul 17 16:21:13 2006	31	Finished mail processing.
Information	Mon Jul 17 16:21:13 2006	33	End sending e-mail.
Information	Mon Jul 17 16:21:13 2006	35	Loaded 0 messages to send.

Figure 2-41. Event Log

Log Tab

The RM Mail service writes information to the system application log to inform the user of events that have happened. The **Log** tab allows you to specify the log level.

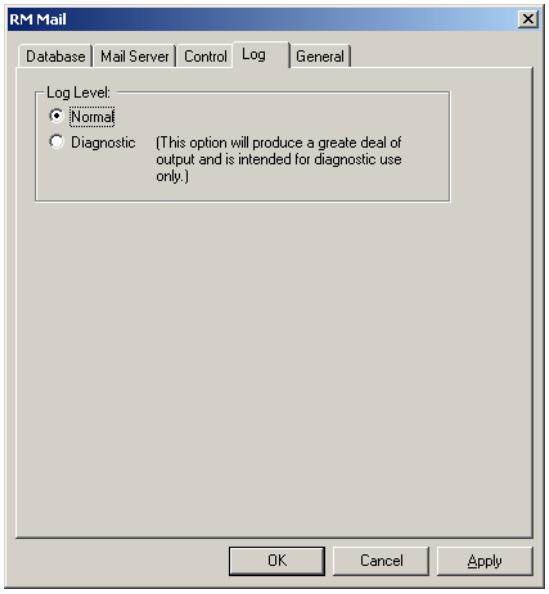


Figure 2-42. RM Mail—Log Tab

The default log level is **Normal**, which logs a minimum of information to the system application log and is the recommended option for normal use.

The **Diagnostic** option helps locate problems that might occur and logs every operation that the RM Mail service performs. This generates much information in the system application log, which could fill the log. When running in verbose mode, it is recommended that the application log be configured to overwrite older events to avoid generating warning messages by the operating system.

General Tab

The **General** tab is used to specify the RM Browser URL for RM Mail service.

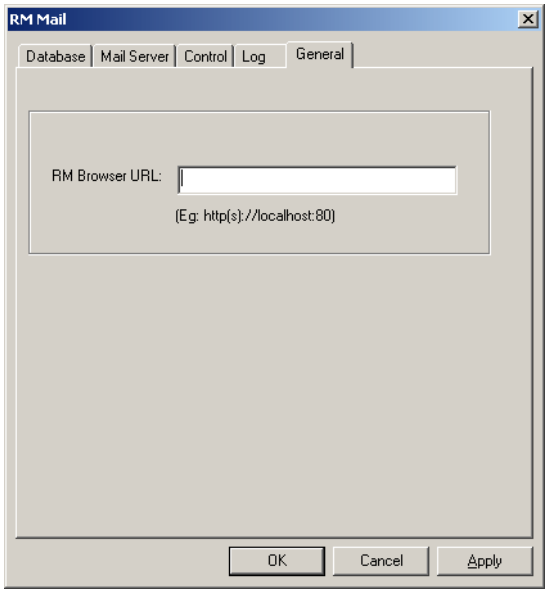


Figure 2-43. General Tab

Configuring Login Sources

Dimensions RM supports multiple login sources, including:

- **LDAP**: Lightweight Directory Access Protocol. Use this source to authenticate user IDs and passwords against an LDAP server.
- **RM**: Use this source to authenticate user IDs and passwords that are stored in Dimensions RM.

You can specify that one or both sources be used to authenticate users, and specify the order in which they should be used. The order of the sources is pertinent when a user exists in both the LDAP directory and the Dimensions RM database, and has a different password in each.

If both sources are specified, and the first login attempt fails because the user is not found, Dimensions RM looks for the user in the next source. For the LDAP source, you can specify multiple LDAP servers and their order. A new Dimensions RM user can be automatically created after a user has been authenticated against LDAP, if so configured.

NOTE If the login fails due to an invalid password, no attempt is made to authenticate against the next login source.

The following steps describe the process that takes place when LDAP is used as a login source.

1. The user's credentials are authenticated against the LDAP server.
2. The user's LDAP user name is used to log the user into Dimensions RM. If a password is stored for the user in Dimensions RM, it is ignored.

3 If the user does not already exist in Dimensions RM, the user is created using specified criteria (this is optional).

NOTE The group and project to be associated with new users must be set up before configuring LDAP as a login source.

Specifying Login Sources

You can specify both Dimensions RM and LDAP as login sources, or just one of them. You can also change the order in which the sources are used to authenticate users.

To specify login sources:

1 Select the database for which you want to set login sources.

2 Select **File** | **Configure Login Sources**, click the **Configure Login Sources** button , or right-click the database and select **Configure Login Sources**.

3 Enter the password for the ICDBA account if prompted to do so.

The **Configure Login Sources** dialog box opens.

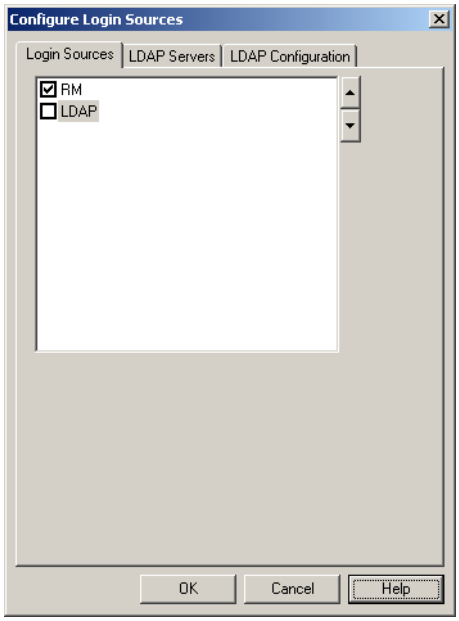


Figure 2-44. Configure Login Sources—Login Sources Tab

4 Select the login sources that you want Dimensions RM to use.

5 Use the up and down arrow buttons to change the order of the sources. The order that you define here is the order in which Dimensions RM attempts to authenticate users.

6 Do one of the following:

- If you did not select LDAP as a login source, click **OK**.
- If you selected LDAP as a login source, proceed to "Specifying an LDAP Server," next.

Specifying an LDAP Server

If you plan to use LDAP as a login source, you must specify one or more LDAP servers.

To specify an LDAP server:

1. If the **Configure Login Sources** dialog box is not already open, do the following:
   - **a** Select the database for which you want to specify an LDAP server.
   - **b** Select **File** | **Configure Login Sources**, click the **Configure Login Sources** button , or right-click the database and select **Configure Login Sources**.
   - **c** Enter the password for the ICDBA account if prompted to do so.

     The **Configure Login Sources** dialog box opens.
2. Click the **LDAP Servers** tab.

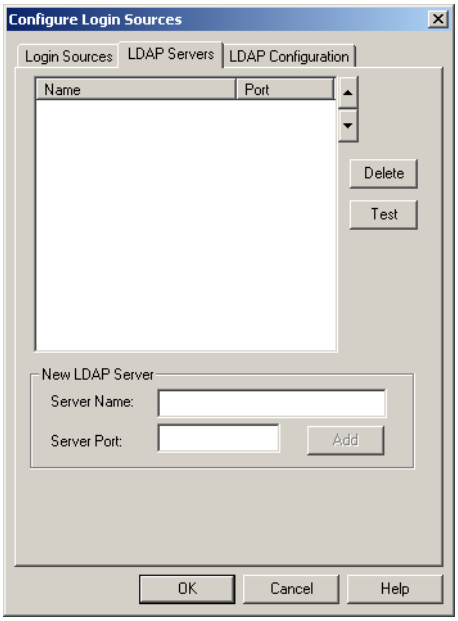


Figure 2-45. Configure Login Sources—LDAP Servers Tab

3. To add a server to the **LDAP Servers** list, complete the following fields:
   - **a** **Server Name:** Enter the host name or IP address of the LDAP server. For example, `myserver.mydomain.com`
   - **b** **Server Port:** Enter the port number of the LDAP server. LDAP servers are typically configured to use port 389 (no Secure Socket Layer (SSL)) or 636 (SSL).
   - **c** **Add:** Click to add the server to the **LDAP Servers** list.

NOTE If you are using redundant servers, add each server to the list. If you are using referrals to search among unique servers, only one server is needed in the list.

4. Select a server in the **LDAP Servers** list and do any of the following:
   - To reposition the selected server in the LDAP Servers list, click the up or down arrow button. Dimensions RM searches for login authorization starting from the top of this list.

- To delete the selected server from the list, click **Delete**.
- To test the connection to the selected server, click **Test**.

5 Proceed to "Specifying the LDAP Configuration," next.

Specifying the LDAP Configuration

If you are using LDAP as a login source, you must specify an LDAP configuration.

To specify an LDAP configuration:

1 If the **Configure Login Sources** dialog box is not already open, do the following:

a Select the database for which you want to specify an LDAP server.

b Select **File** | **Configure Login Sources**, click the **Configure Login Sources** button , or right-click the database and select **Configure Login Sources**.

c Enter the password for the ICDBA account if prompted to do so.

The **Configure Login Sources** dialog box opens.

2 Click the **LDAP Configuration** tab.

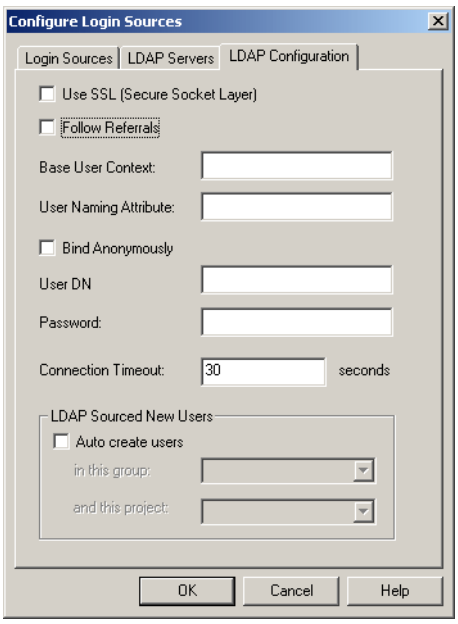


Figure 2-46. Configure Login Sources—LDAP Configuration Tab

3 To enable Secure Socket Layer, select the **Use SSL (Secure Socket Layer)** check box.

4 To allow Dimensions RM to follow referrals from one LDAP server to another, select the **Follow Referrals** check box. Use this feature to support properly configured non-redundant distributed servers.

5 In the **Base User Context** field, specify the base user context (distinguished name). This is the base from which to search for users.

6 In the **User Naming Attribute** field, specify the user naming attribute. This is the attribute in which the LDAP server holds the user ID value.

7 Select a method for querying the LDAP server to retrieve the list of users:

- To query anonymously, select the **Bind Anonymously** check box. This requires that the LDAP server is configured to allow anonymous users to retrieve a list of users and attributes.

NOTE You cannot bind anonymously to a Microsoft Active Directory Server.

- To require a user ID and password for queries:

a In the **User DN** field, specify a full user DN.

b In the **Password** field, specify a user password.

NOTE The **User DN** and **Password** fields are disabled if the **Bind Anonymously** check box is selected.

8 To set the idle time in seconds before the connection to the LDAP server times out, enter a value in the **Connection Timeout** field.

9 To automatically create user IDs in Dimensions RM for users authenticated through LDAP, select the **Auto create user** check box.

10 To specify information for when a new user is automatically created, do the following:

a From the **in this group** list, select the group in which the user is to be created.

b From the **and this project** list, select the project to which the user is allowed access.

NOTE You can assign users to additional projects through RM Manage.

11 Click **OK**.

Example LDAP Configurations

The following illustration follows shows a typical non-SSL LDAP configuration for Microsoft Active Directory Server.

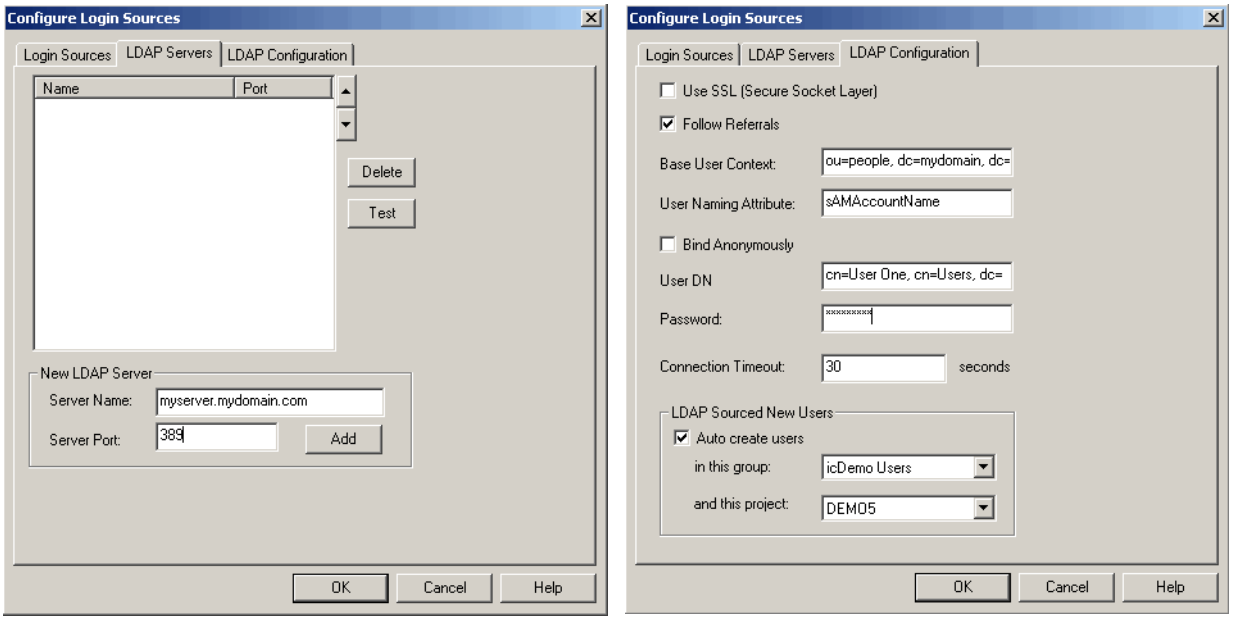


Figure 2-47. Example Non-SSL LDAP Configuration

The full content of fields that are truncated in the illustration follows:

- **Base User Context**—ou=people, dc=mydomain, dc=com
- **User DN**—cn=User One, cn=Users, dc=mydomain, dc=com

The following illustration shows a typical SSL LDAP configuration for Netscape Server.

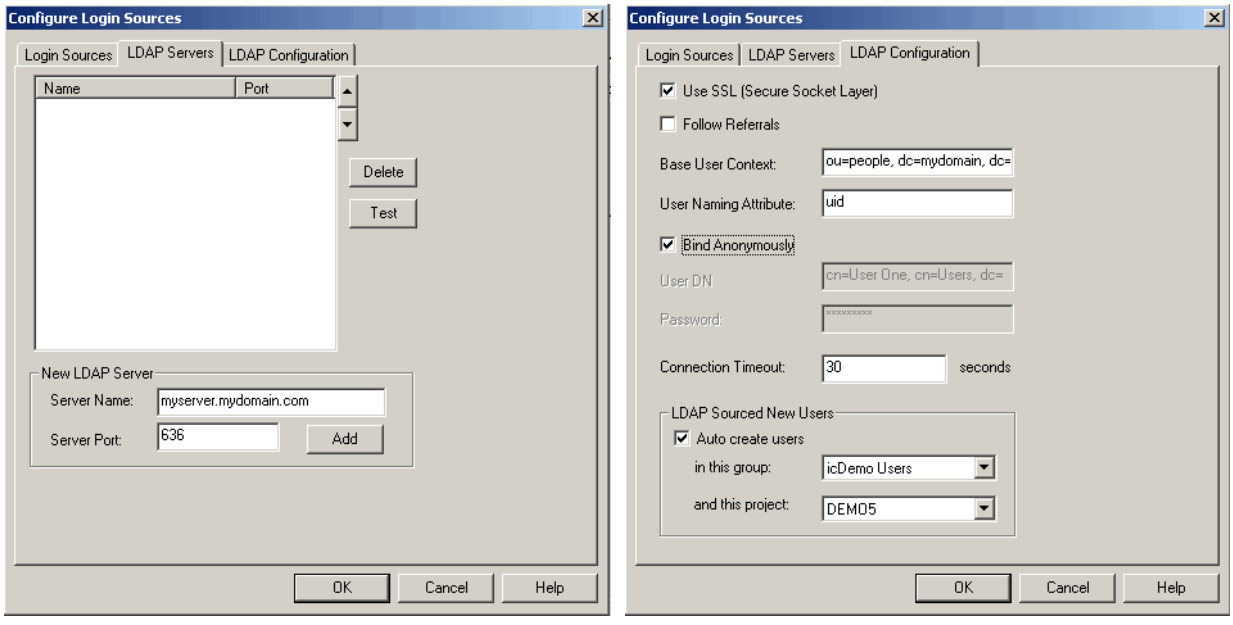


Figure 2-48. Example SSL LDAP Configuration

The full content of the **Base User Context** field (truncated in the illustration) is: ou=people, dc=mydomain, dc=com

Configuring LDAP to Use SSL

If your LDAP server is configured to use Secure Sockets Layer (SSL), but there is not a certificate database in the `LDAP_Certificates_Directory` or the database is missing the required SSL certificates, you will receive errors, such as:

```
"Failed to connect to LDAP server." or "You cannot access this
    project because your login account, UserName, is invalid. . . ."
```

To create and populate a certificate database:

1. Download the Netscape Navigator software at:

   http://browser.Netscape.com/downloads/archive

2. Get Netscape version 4.79 for Windows

3. Open the following URL using the Netscape browser:

   `http://YourServer:SSLport`

   where:

YourServer	is the IP address or host name of your LDAP server.
SSLport	is the TCP/IP port number used by your LDAP server for SSL connections (usually 636)

4. Follow the instructions on the Netscape Certificate Name Check window, and accept the server certificate for future sessions.

5. Close Netscape.

6. Start RM Manage and login into the appropriate database.

7. Open the **Configure Login Sources** dialog box as follows:

   a Select the database for which you want to specify an LDAP server.

   b Select **File** | **Configure Login Sources**, click the **Configure Login Sources** button , or right-click the database and select **Configure Login Sources**.

   c Enter the password for the ICDBA account if prompted to do so.

   The **Configure Login Sources** dialog box opens.

8. Select **LDAP** as a Login Source.

9. Select the **LDAP Servers** tab.

10. For the new LDAP server, enter the appropriate details in the **Server Name** and **Server Port** fields, and click **Apply**.

11. Select the **LDAP Configuration** tab

12. Check the **Use SSL (Secure Socket Layer)** check-box, and fill in the other data as needed for your site (see "Specifying the LDAP Configuration" on page 105).

13. Click **OK** to update the information within your RM Projects database.

14. Open a Windows Command Prompt window and log in to SQLPlus as Oracle user `ICDBA`, for example:

```
sqlplus icdba/<icdba_password>@rm
```

15 Enter the following SQLPlus command to update the LDAP servers in your instance of RM:

```
update icadmin.ldap_servers set ldap_certificate_directory =
    "X:\directory_path_to_store_certificates";
```

where:

X:\	is a shared drive for storing the LDAP certificates that all users can access. If such a setup as this is not possible, then all users are required to create a directory on their local system and have the LDAP certificates created earlier copied to their local system.
directory_ path_to_store _certificates	is the complete directory path to the location of LDAP certificates on either a shared directory path or a local path that will be *exactly* the same for all users.

16 When that command completes, enter in the following commands:

```
commit;
alter system checkpoint;
exit;
```

17 Copy the `key3.db` and `cert7.db` files from the Netscape user profile directory to the `directory_path_to_store_certificates` directory.

18 LDAP is now configured to use SSL.

Setting Up Password Security

Password security is set in the **Password Rules Settings** tab that can be accessed in the project view.

Setting Password Rules

Password rules are common to all user accounts. Any changes made to password settings affect all user accounts.

NOTES Password rules only apply to RM user accounts (RM Login Source). They *do not* apply to RM access using LDAP accounts.

Password rules apply to RM databases, not to individual projects.

Whenever a new user is created, the default password is `rtm`.

To set password rules for all user accounts:

1 Select **View** | **Projects**.

2 Click the **Password Rules Settings** tab.

3 Provide entries for the following settings:

Setting	Description
eMail account for notifications	The administrator's e-mail address for users who want to contact the administrator when their account is locked.
Minimum number of characters to be changed	The minimum number of characters that users must change in their old password when creating a new one. The maximum number for this setting is 99. **NOTE** When you reset the password for an existing user, this setting is not validated.
Minimum number of digits	The minimum number of digits that a password must contain. The maximum number for this setting is 99.
Minimum number of letters	The minimum number of letters that a password must contain. The maximum number for this setting is 99.
Minimum number of special characters	The minimum number of special characters that a password must contain. The following special characters are allowed: ! " # $ % & ' ( ) * + , - _ / : ; < = > ? [\ ] ^ { | } ~ ` The maximum number for this setting is 99.
Minimum length of password	The minimum number of digits, letters, and special characters that the password must contain, based on the previous three settings. The maximum number for this setting is 99.
Minimum number of failed logins before auto disable	This is the number of allowable attempts with the wrong password before the account is locked. The maximum number for this setting is 99.
Password expiration days	The number of days until users must change their password. The maximum number for this setting is 9999.
Number of days before password expiry warning	The number of days before a password is due to expire, when users are notified of the pending expiration date and given the opportunity to change their password. A warning message is displayed every time users log in using any Dimensions RM tool. The maximum number for this setting is 999.
Number of previous passwords (history) to be stored	The number of passwords to be stored for each user. Users will not be allowed to reuse any of these passwords. The maximum number for this setting is 9999.

Setting	Description
Number of days to store previous passwords (history)	The number of days to store any previously used passwords. When the limit is reached, the stored passwords are deleted. The maximum number for this setting is 9999.
Start date to apply password rules for on-expiring passwords.	By default, unless changed as described below, password rules for non-expiring passwords will be enforced starting on 31-DEC-2099. If you do not wish for this to occur, uncheck the associated tick mark. Alternatively, to assign an alternative date for password rules to be enforced, either: ■ select and overtype, as appropriate, the day, month, and year; or ■ click the down-arrow and use the calendar dialog box that appears.

4 Click **Accept Changes**.

ALM Integration Between Dimensions CM and Dimensions RM

The Application Lifecycle Management (ALM) integration between Dimensions CM and Dimensions RM lets you associate Dimensions RM requirements to Dimensions CM requests.

The ALM integration enables you to manage Dimensions RM requirements in Dimensions CM and, conversely, manage Dimensions CM requests in Dimensions RM. For example, when you add a requirement to or remove a requirement from a Dimensions RM container, Dimensions CM is notified with the relevant information; also, Dimensions RM baselines flow to Dimensions CM and Dimensions CM baselines flow to Dimensions RM.

In the context of an ALM integration, you can:

- Associate Dimensions RM projects a Dimensions CM products.
- Associate Dimensions RM containers (baselines or collections only) to Dimensions CM projects/streams.

See the common *Dimensions CM-Dimensions RM ALM Integration Guide* for details.

Logging In to a Dimensions CM Server

See the common *Dimensions CM-Dimensions RM ALM Integration Guide* for details.

Associating Dimensions RM Projects to Dimensions CM Products

See the common *Dimensions CM-Dimensions RM ALM Integration Guide* for details.

Associating Dimensions RM Baselines or Collections to Dimensions CM Projects/Streams

See the common *Dimensions CM-Dimensions RM ALM Integration Guide* for details.

Command Line Parameters

The Dimensions RM tools provide some command line commands that you can use for common tasks.

Tool	Action	Command
RM Capture	Launch RM Capture.	`capturetool -user user -password password -location database -project project`
	Open document in RM Capture.	`capturetool -documentid documentid -user user -password password -location database -project project`
RM Manage	Launch RM Manage.	`icmanage -user user -password password -location database -project project -buffer buffer -dumpfile dumpfile`
	Back up database	`icmanage -location <database instance name> -project <project name> -password <project password> [-buffer <buffer size>] -dumpfile <name and path of backup file to be created>`
Synch Engine	Run the Synch Engine	`syncengine [-f file] [-c] [-e level] [-E file] [-L priority] [-k {install|config|uninstall|start|stop}] [-n serviceName] [-v] [-h] [-p password] [-P eventName]`
ALF Emitter	Run ALF emitter service, see "Application Lifecycle Framework (ALF)" on page 195	`ALFEventEmitter [-f file] [-c] [-e level] [-E file] [-L priority] [-k {install|config|uninstall|start|stop}] [-n name] [-v] [-h]`
Class Definition	Launch class definition.	`clasdef -user user -password password -location database -project project`

Chapter 3

Class Definition

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Overview

CAUTION! All users must be off the system before making any changes in Class Definition to preclude schema changes during user operations. There should *never* be an exception to this rule on a production system.

It is best practice, before saving from class definition, to always:

1 Stop the Microsoft IIS or Apache Web Server.

2 Stop the pool manager service.

3 Review and drop all locks.

4 Backup projects.

5 Post/save Class Definition changes.

6 Start the Microsoft IIS or Apache Web Server.

7 Start the pool manager service.

The class definition process, also known as the schema creation process, is the first step in Serena® Dimensions® RM project management. This process sets up project flows and logical groupings of information and is the responsibility of the project administrator.

Defining classes for a project enables you to perform the following functions:

- Organize information according to meaningful categories (classes).
- Qualify the information within each class according to attributes you define for the class. This enables you to search the project based on specific criteria.
- Maintain relationships between the classes for traceability.
- Specify the user access rights and the source documents associated with each class.

The class definition process produces the logical information model for the project. Dimensions RM illustrates this model in a Class Definition diagram, a graphic representation of the classes and relationships you have defined. You can point-and-click to manipulate the diagram and to open associated definition windows for additions or changes.

Defining the Project Schema

A project administrator can use the Class Definition tool to construct the information model for a project in the form of a Class Definition diagram. You use the Class Definition tool to perform the following tasks:

- Define new classes; rename, modify or delete existing classes
- Define or delete attributes for each class and relationship
- Specify user access rights to each class
- Create relationships between classes
- Manipulate the class definition diagram

Class Definition Tasks

There are three broad categories of class definition tasks:

- Project assessment—An examination of the project in terms of its development phases and available information.
- Class development—The definition of classes and class attributes, relationships, users and source documents.
- Process documentation—The documentation of all critical information used and decisions made throughout the class definition process.

Examining the Information in Terms of Project Phasing

Before defining classes, it is important to evaluate the type and scope of information to be modeled. The following information will help you understand your project so that the most effective class definition model can be developed.

- Identify the type of project. Is it a feasibility study, a project plan, a prototype, or a full-scale development project? This will help you determine the phasing for the project and decide how much information needs to be modeled, where the emphasis should be placed and what kinds of reports will be needed.
- Assess the documentation and reporting requirements for the project. They vary with the type of project and are also influenced by reports that your organization may have produced in the past. For example, if the project is a feasibility study, risk assessment is a major issue, and you will probably want to report on high-risk components of the project.
- Identify the customer and proprietary information that should be modeled and tracked through the successive phases of the project.
- Assess which subsets of the project information will be the most significant and/or useful to the project.
- Consider how previous experience can assist in identifying what information needs to be modeled. You may be able to use a modified version of an existing Dimensions RM information model.
- Identify the development phases for your project.
- Identify the information classes needed for the beginning phase, such as functional specifications.
- Identify the information classes needed for the final phase, such as test results (unit, integration and acceptance).
- Determine the required information flow between phases. This helps to identify the relationships between classes.
- Determine if some of the project will be subcontracted to off-site development teams and requires partitioning of the information.

Assessing the Project Information

Assess the detail level of the information available, and capture some basic assumptions about the structure of the information. Information assessment helps you to determine the structure of your information model. The following table describes the categories of information typically associated with projects.

Detail Level	Description
Very General	General or summarized information, such as operational scenarios or marketing plans.
High-level	High-level information, such as system specification narratives that cover design constraints, desired features and elements that should not be included in the solution.
Detailed	Detailed information, such as subsystem specifications that provide implementation level details.
Low-level	Low-level details, such as a requirement for a certain version of software or hardware.

Assessing Operations Parameters

Assess and define the project's operational parameters, such as:

- The required level of tracking among requirements, other project information, and information generated by CASE tools.
- The members of the project team, their responsibilities, and the access rights each will require for various types of project information during specific phases. User access rights assist you in determining which classes need to be created, which documents will be associated with each class and what is the logical breakdown of the data.

Identifying the reports that are generated helps you determine the attributes that will be needed later for searching, sorting, and printing.

Naming Classes, Attributes, and Categories

Names of classes, attributes, and categories can contain only letters (`A–Z` and `a–z`), numbers (`0–9`), and underscores (_).

Class Definition

A class definition consists of the following components:

- A description of the class.
- The definition of attributes for the class.
- The specification of user access rights for the data assigned to the class.
- The identification of the class's relationship to other classes.

The first steps in class development are: adding classes to the class definition diagram, specifying the class types, and assigning names to each class.

The following table lists the core class types. You can create any kind class type.

Core Class Type	Description
Comment	For associating comments with objects in other class types. The comment class is particularly useful when using RM Browser, as the comment class allows users to store comments using the Internet.
ECP	For Engineering Change Proposals.
Generic	For general information (other than requirements or CASE tool data), such as acceptance test descriptions and software problem reports.
Poll	For storing polling data associated with requirements.
Requirement	For different levels of requirements information.

Class Attributes

Attributes allow you to manage a known set of properties for each class. Attributes are distinctive pieces of information. When class attributes are present, it becomes possible for project members to search for project information based on specific criteria (specific values of the attributes).

User Access to Classes

Once a class type is defined, and attributes are assigned to the class, user access rights must be defined. This determines who can access the information associated with the class. Users can be granted access at the project level, thereby granting them access to all classes.

Relationships Between Classes

After you have defined the classes, you can set up (and name) relationships between pairs of classes. Typically, each class is related to at least one other class. Without this connection, it is not possible to establish traceability between sets of information.

A relationship identifies how information in one class is connected to information in another class. For example, if you would like to tie a test result back to a program, you would state the relationship as "module is tested by acceptance tests." In this example, *module* is the name of the first class (also known as the primary class), *is tested by* is the name of the relationship, and *acceptance test* is the name of the second class (also known as the secondary class). This will set up the relationship between test results and modules, and enable traceability to occur between them. Engineers could then check for specific objects associated with either class.

In other words, you can retrieve information based on specific search criteria. Establishing links between objects based on certain attribute values does this. For example, a link could be created between a change request and a requirement based on the value of its approval status attribute (the values being *approved* or *disapproved*). These links are governed by the rules you set up for the relationship.

Dimensions RM relationships identify related classes. When a Dimensions RM relationship is defined, the primary class and the secondary class are identified for the relationship. A

primary class can be thought of as the *source class*, and a secondary class can be thought of as the *target class*. Every RM relationship, even recursive or re-entrant relationships, must have a primary and a secondary class. In the class definition diagram, the class at the base of the relationship connector is considered the primary class. The class at the tip of the connector is considered the secondary class.

Relationship Rules

You can set up relationship rules to govern user creation of links and determine the impact of their object edits on the relationship. For example, you can limit the number of links from one object to another, specify what should happen to an object link if the user edits the object, or only allow links based on the value of the attribute.

Process Documentation Phase

It is important to document all critical information throughout the project assessment and class definition phases, as this information forms the basis of your project configuration decisions and will need to reference it later. Other reasons for this documentation include:

- Referencing earlier decisions for the purpose of maintaining consistency.
- Maintaining this information for future projects.
- Helping others understand the rationale for information modeling decisions.

The following are examples of this information:

- The purpose and meaning of each class, attribute and relationship.
- A code of practice defining responsibilities for each aspect of Dimensions RM operation.
- The results and rationale for every information-modeling decision.

You can print the details of each class definition to store with your documentation.

Attributes for Specific Classes

When users click **Add Comment** button under **Requirements** in **Requirement View** in the RM Browser, the **Add a Comment** dialog box opens. By default, this dialog box contains a **Role** dropdown selection menu. You can omit this menu when you define the comment class.

To define the comment class to omit the Role menu:

1. Start Class Definition (see "Starting Class Definition" on page 121).
2. Select a comment class on the Class Definition diagram.
3. Right-click and select **Define**. The **Definition of class** dialog box opens.
4. Click the **Attribute** tab.
5. In the list of attributes, under **User Defined**, double-click **Role**. The **Definition of attribute 'Role'** dialog box opens.
6. Click the **Core** tab.

7 Clear the **Attribute Editable** check box, and then click **OK**.

8 In the **Definition of class** dialog box, click **OK**.

Starting Class Definition

To start Class Definition:

1 Start RM Manage.

2 Select the project to be configured.

3 Click the **Define Project Schema** button .

If you are a project administrator, the project schema is launched in a Read/Write mode if another user is not currently modifying the schema. If you are a project administrator and another user is modifying the project schema, the **Project Schema Locked** dialog box is displayed, identifying the user currently holding the lock. A user locks a project schema whenever it is open in read/write mode.

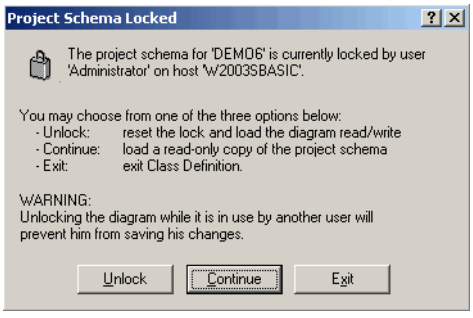

Figure 3-1. Project Schema Locked

If you are sure the user identified is not currently modifying the project schema, click **Unlock** to reset the lock and load the schema in read/write mode. Alternatively, you can click **Continue** to load the schema in read-only mode or click **Exit**.

Working with the Class Definition Diagram

The topics in this section describe how to work with the Class Definition diagram.

Editing the Project Header and Footer

You define the project-wide header and footer in the Class Definition diagram. A default header and footer are created when a new project is created.

To edit the header or footer:

1 Do one of the following:

- Double-click the header or footer object on the canvas.
- Select **Edit** | **Header** or **Edit** | **Footer**.

- On the **Edit** toolbar, click the **Edit Header** or **Edit Footer** button.

2 Type the header or footer text you want in the space provided on the canvas.

If a header or footer is not required for the project, it can be removed from the diagram by selecting the object and clicking **Delete**.

Aligning Components

You can line up multiple components using the alignment buttons, or align a component by any edge or by its center. For a multiple selection, use the gray selection handles as the point of reference to which components align. The following six alignment commands can be accessed from the **Alignment** toolbar or the **Drawing** menu.

- Align Top
- Align Middle
- Align Bottom
- Align Left
- Align Center
- Align Right

Canvas Grid

The grid is a set of evenly spaced points on the canvas that are used to align components when they are moved. When the snap-to-grid option is enabled, the top left corner of a component is aligned to a grid point when the component is moved. The snap-to-grid feature can be enabled and disabled using by selecting **Snap to Grid** from the **View** menu. Grid visibility can be turned on and off by selecting **Grid** from the **View** menu.

To change the distance between the points of the grid, or to change the color of the grid, select **Grid Properties** from the **View** menu.

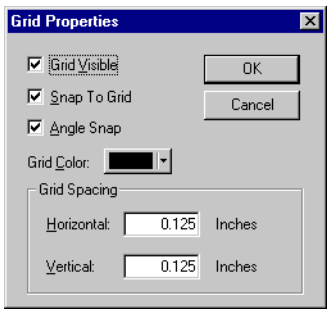

Figure 3-2. Grid Properties

Centering the Diagram

To center a diagram:

- Select **Edit** | **Center Diagram** or click the **Center Diagram** button on the **Edit** toolbar.

All components in the project schema become centered, providing equal area on each side of the diagram for adding additional components.

Changing the Canvas Size

You can resize the canvas if it is too large or too small to hold the project schema.

To change the canvas size:

1 Select **Edit** | **Resize Canvas** or click the button on the **Edit** toolbar. The **Resize Canvas** dialog box opens.

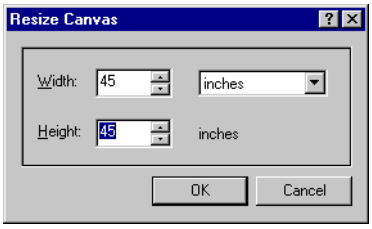

Figure 3-3. Resize Canvas

2 Enter the new width and height in the dialog box. You can enter the new dimensions in inches, millimeters, or centimeters.

3 Click **OK**.

This operation may take time to complete, depending on the complexity of the project schema. Once the schema has been resized, the components will be centered on the canvas, giving an equal amount of space on all sides to add new classes and relationships.

Finding a Class or Relationship

A class or relationship can be located on the Class Definition diagram.

To find a class or relationship:

1 Select **Find** from the **Edit** menu, or click the **Find** button on the **Edit** toolbar. The **Find Components** dialog box opens.

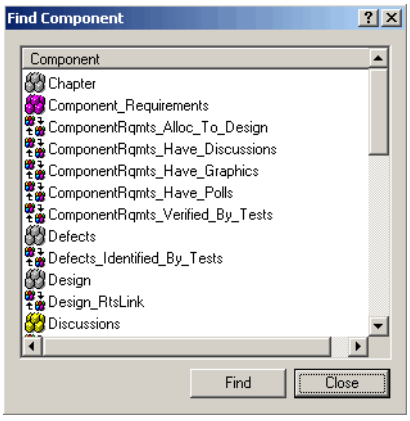

Figure 3-4. Find Component

2 Select a component and then click **Find**.

Nudging Objects

When Class Definition is in selection mode, you can move selected components by clicking and dragging the mouse. When you place the pointer over a component that you can move, the cursor changes to a crosshair. If the **Snap to Grid** option is enabled, the top-left corner of the component's bounding box aligns with the grid.

You can move selected components by using Nudge commands. The Nudge commands move the components one unit by default and five units if you are holding the Shift key. You can access four nudge commands from the **Nudge** toolbar or the **Drawing** menu.

- Nudge Up
- Nudge Down
- Nudge Left
- Nudge Right

Ordering Objects

The components on the Class Definition diagram can be stacked (also known as Z-order). Stacking determines where each component is drawn in the stack. In other words, the order determines which component is drawn last. The component drawn last overwrites the components already on the canvas. Z-order is determined by the order in which the components are added to the model. The last component to be added will be on top.

You can change the Z-order using order commands. The **Bring Forward** command moves a component one place in the direction of the top of the stack. The **Send Backward** command moves a component one place in the direction of the bottom of the stack. A component can be moved directly to either the top or bottom of the stack using the **Bring to Front** or **Send to Back** commands.

Each of these commands is available either from the **Structure** toolbar or the **Drawing** menu.

- Bring to Front
- Send to Back
- Bring Forward
- Send Back

Panning the Diagram

To pan the diagram:

1. To pan to different areas of the diagram, click the **Pan** button .
2. Click and drag the mouse to navigate the diagram.
3. To return to editing the diagram, click the **Select** button .

Selecting Objects

Class Definition starts in selection mode. You can access selection mode by clicking the **Select** button .

You can select a single component by left-clicking it in selection mode. If you want to select multiple components, hold the CTRL key and then left-click each of the components you want to include in the selection, or click and drag to draw a selection rectangle. Gray selection handles distinguish the last-selected component. Class Definition uses anchor components as a reference for alignment operations. If you want another component to serve as the anchor, hold the CTRL key and click another component within the selection.

Zooming the Diagram

The Class Definition tool provides several options for zooming.

- **Zoom to Fit**

  Click the **Zoom to Fit** button to scale the diagram such that all components on the diagram are visible in the viewport.

- **Zoom to Selection**

  Click the **Zoom to Selection** button to scale the diagram such that all selected components are visible in the viewport. To select multiple components, hold down the Shift key while clicking the left mouse button on the class or relationship you want to add to the selection. This button will only be enabled when multiple classes, relationships or both have been selected.

- **Zoom Normal**

  Click the **Zoom Normal** button to scale the diagram to its default zoom of 100%. This button will only be enabled when the diagram is zoomed other than 100%.

- **Zoom**

  Click the **Zoom** button to zoom in or out on the canvas. The pointer becomes a magnifying glass when you place it in the client area. In zoom mode, you can click the left mouse button to zoom in or the right mouse button to zoom out. You can set the zooming percentage by selecting **Zoom Custom** from the **View** menu.

  To zoom in on a selected area, click and hold the left mouse button while in zoom mode. When you hold the mouse button and drag in zoom mode, the Class Definition tool draws a rectangle to indicate the zoom area. When you have the rectangle positioned in an area of the viewport, release the mouse button to select the area for zooming.

To return to the diagram, click the **Select Tool** button .

Attributes

Attributes specify the exact nature of the information within a class or relationship. You can define any number of attributes for each class and relationship. In addition to these user-defined attributes, there are implicit predefined attributes.

NOTE There are two implicit attributes that represent who created a requirement. The "Initial Created by" attribute contains the name of the user who initially created a requirement, and is retained when the requirement is replaced by another user. The name of the user who replaced the requirement is stored in the "Created by" attribute.

Adding an Attribute

To add a new attribute to a class or relationship definition:

1. Do one of the following to open the **Definition of class** or **Definition of relationship** dialog box:
   - Double-click the desired class or relationship.
   - Right-click the desired class or relationship and select **Define**.
2. To add the attribute to the class or relationship definition, click the appropriate button at the left of the panel for the user-defined attribute type you want to add. The buttons and the attribute types they represent are shown in the following table. For a full description of the attributes, see "Attribute Types" on page 128.

	Action attribute
A1	Alphanumeric attribute
	Date attribute
	Graphic attribute
	List attribute
1.2	Numeric attribute
T	Text attribute
	File Attachment attribute

3. Click **OK**.

Defining an Attribute

To define an attribute:

- Double-click the attribute in the tree control, or highlight it and press **Enter**.

The **Definition of attribute** dialog box opens.

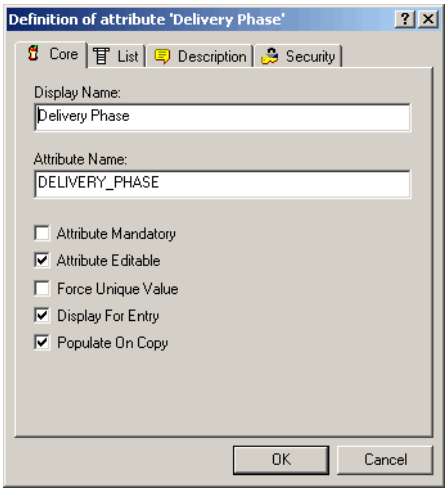

Figure 3-5. Attribute Definition

Core Tab

The **Core** tab is displayed for all attribute types and is used to define attribute properties that are common to all attribute types. The core attribute properties are defined in the following table.

Property	Description
Display Name	The name of the attribute that will be displayed by the other Dimensions RM tools. The display name can be up to 1000 characters in length and can contain any printable characters.
Attribute Name	The internal name of the attribute, which can be up to 1000 characters in length, but cannot contain spaces. This field is populated automatically for a new attribute based on the display name if no value is provided.
Attribute Mandatory	Whether you are required to specify values for the attribute during the information storage or capture process.
Attribute Editable	Whether you can edit the attribute values. Conversely, making an attribute non-editable is useful when no further changes to the attribute are allowed.
Force Unique Value	Whether you must enter a unique value for an instance of this attribute (no duplicate values are allowed). This may be grayed out.
Display For Entry	Whether the attribute will be displayed in forms and list views of object content. If unchecked, the attribute will not be presented in these views. This is generally used for security.
Populate on Copy	Whether the attribute will be pre-populated when you copy a requirement. To prevent the situation where duplicate requirements are created by mistake, it is a good practice *not* to copy the Title and Description attributes.

Attribute Type Tab

The second tab is specific to the attribute type selected in Step 2 on page 126. The graphic and file attachment attributes have no attribute type tab. The attribute type tabs are described under "Attribute Types" on page 128.

Description Tab

The **Description** tab is used to add a description to the attribute.

Security Tab

The **Security** tab allows a security profile to be created for the attribute. For information about entering properties on the **Security** tab, see "Security" on page 155.

NOTE You can edit an attribute definition at any time after having defined it. This could mean that values of the attribute are no longer valid for certain instances of the class. For example, if a Force Unique Value property is added to a numeric attribute, existing values of this attribute that are not unique must be identified and altered by making it unique through replacement or batch update.

Deleting an Attribute

To delete an attribute from a class or relationship definition:

1. Do one of the following:
   - Double-click the desired class or relationship.
   - Right-click the desired class or relationship and select **Define**. The **Attribute Definition** dialog box opens.
2. Select the attribute you want to delete from the definition.
3. Click the **Delete** button or press the **Delete** key.
4. Click **OK**.

NOTE Implicit attributes cannot be deleted from the class or relationship definition.

Attribute Types

The following sections describe the attribute types. If the attribute has a second tab specific to the attribute, its parameters are included in the description.

Action Attribute

An action attribute is a program that is to be invoked at object creation or other user-specified times. It is a pointer to a file that is held internal or external to RM, and it indicates the method of accessing the file.

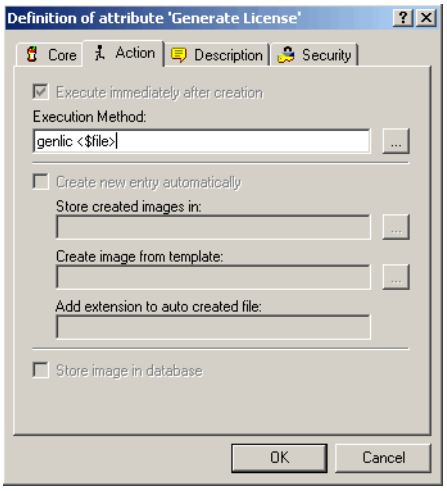

Figure 3-6. Action Attribute Definition

The action attribute property is described in the following table.

Property	Description
Execution Method	The executable to be used to read the action attribute. Adding the string <$file> after the executable passes the filename as a parameter. If no execution method is provided, the file will be opened with the application registered for that file type (for example, a `.doc` file will be opened with Microsoft Word).

Alphanumeric Attribute

An alphanumeric attribute represents one line of alphanumeric text, such as the title of an acceptance test. It can be up to 1000 characters in length.

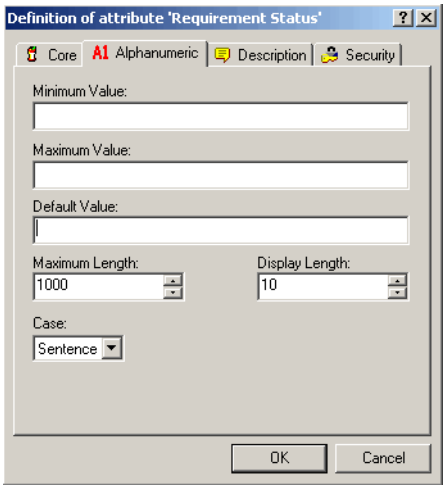

Figure 3-7. Alphanumeric Attribute Definition

The alphanumeric attribute properties are described in the following table.

Property	Description
Minimum Value	A minimum value that can be associated with the attribute, if any. Dimensions RM performs a string comparison on the minimum and maximum values. For example, if you enter a minimum value of A and a maximum value of C, Dimensions RM will inform you that a value of D is out of range.
Maximum Value	A maximum value that can be associated with the attribute, if any. Dimensions RM performs a string comparison on the minimum and maximum values. For example, if you enter a minimum value of A and a maximum value of C, Dimensions RM will inform you that a value of D is out of range.
Default Value	A default value for initial instances of the attribute, if required.
Maximum Length	The maximum length of the value allowed for the attribute. The valid range is 1 to 1000 characters.
Display Length	The default number of characters to display for this attribute. The valid range is 1 to 1000 characters.
Case	Whether the attribute value should be upper case, lower case, or sentence (mixed) case.

Date Attribute

A date attribute can have values that are based on user-defined formats. A date attribute, for example, could be used for test dates.

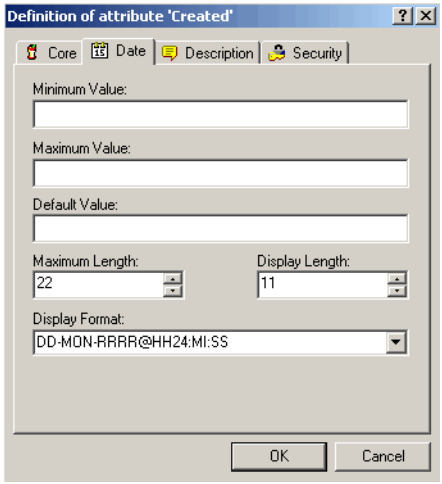

Figure 3-8. Date Attribute Definition

The date attribute properties are described in the following table.

Property	Description
Minimum Value	A minimum value that can be associated with the attribute, if any.
Maximum Value	A maximum value that can be associated with the attribute, if any.
Default Value	A default value for initial instances of the attribute, if required.

Property	Description
Maximum Length	The maximum length of the value allowed for the attribute. The valid range is 1 to 1000 characters.
Display Length	The default number of characters to display for this attribute. The valid range is 1 to 1000 characters.
Display Format	The date format. **NOTE:** The default date formats use the string "RRRR" to represent a four-digit year. This is preferable to using "YYYY" because when the year is entered as two digits, this format will correctly populate the century based on the rules described in Appendix A, "Date Attribute Formats" on page 213.

Graphic Attribute

A graphic attribute is used to hold either graphics or OLE data captured from RM Word. If you intend to capture either of these data types using RM Word, you should add a graphic attribute to the class into which the data will be captured.

NOTE The graphic attribute has no attribute type tab.

File Attachment Attribute

A file attachment attribute holds a single file that can be accessed through RM Browser. Add one or more file attachment attributes to the class to which the file or files will be attached. For example, you could add the file attachment attributes *Use Cases*, *Customer Letter*, and *Business Justification* to the Marketing Requirements class. Users then use RM Browser to add the applicable file for each attribute, view the file, or download it to their computers.

For more information about using RM Browser to view and manage file attachments, see the *Serena Dimensions RM Browser User's Guide*.

NOTE The file attachment attribute has no attribute type tab.

List Attribute

A list attribute is a configurable attribute that provides a list of values for user selection. For example, you could list `pass`, `fail` and `untested` as the valid values for a list attribute `test_result`, and require that the user choose one or more of these values.

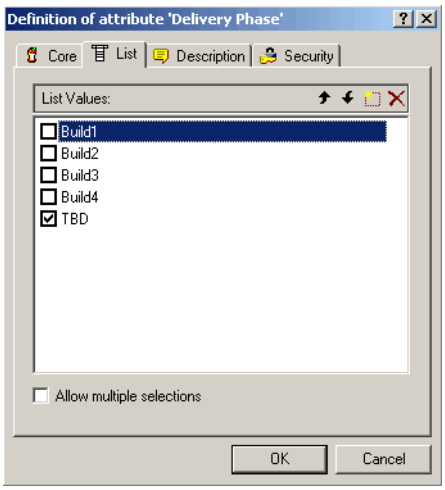

Figure 3-9. List Attribute Definition

The list attribute properties are described in the following table.

Property	Description
List Values	A list of possible values that have been defined for the list attribute. A check in the box to the left of the value indicates this is a default value. Selecting the check box next to the desired attribute value can change the default value state.
Allow multiple selections	Whether the user can select one or more values from the list. If the box is not checked, you can select only a single value from the list.

To add a new value to the list of possible values click the button (or press the **Insert** key) and enter a name to the list. The name for the value must be unique within the list.

To delete a value from the list, highlight the value by left-clicking it and either click the **Delete** button or press the **Delete** key.

Highlight the item you want to move (using the **Move Up** and **Move Down** buttons) to rearrange the values in the list. Alternatively, highlight an item and use the Shift+Up arrow or Shift+Down arrow combinations to rearrange items. Dragging and dropping can also rearrange the list items.

Numeric Attribute

A numeric attribute accepts only numeric values, such as a reference number. The value can include a decimal point.

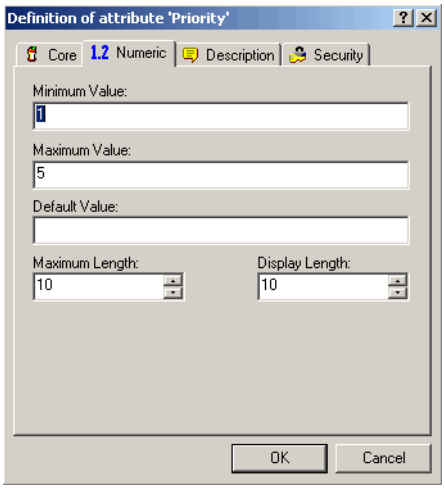

Figure 3-10. Numeric Attribute Definition

The numeric attribute properties are described in the following table.

Property	Description
Minimum Value	A minimum value that can be associated with the attribute, if any.
Maximum Value	A maximum value that can be associated with the attribute, if any.
Default Value	A default value for initial instances of the attribute, if required.
Maximum Length	The maximum length of the value allowed for the attribute. The valid range is 1 to 1000 characters.
Display Length	The default number of characters to display for this attribute. The valid range is 1 to 1000 characters.

Text Attribute

A text attribute is a text block (up to 64Kb) that can span more than one line. It is suitable for long descriptions, such as the description of an acceptance test.

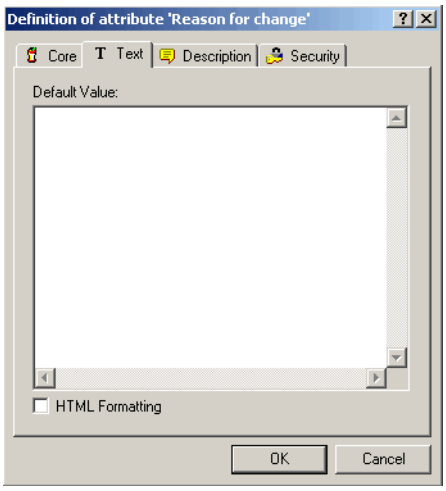

Figure 3-11. Text Attribute Definition

The text attribute properties are described in the following table.

Property	Description
Default Value	A default value for initial instances of the attribute, if required.
HTML Formatting	A check box that allows you to specify whether this text attribute is enabled for HTML formatting. When you edit an HTML-enabled text attribute in RM Browser, a special HTML edit control is displayed in place of the normal text area. The HTML edit control is only available in RM Browser. HTML-enabled text attributes cannot be edited in any of the other tools (for example, RM Concept), and are displayed as read-only text fields with the HTML tags removed. **NOTE:** The HTML Formatting property cannot be disabled in the Chapter class.

Rqmt ID Attribute

The Rqmt ID implicit attribute represents the PUID of a requirement. The PUID is a unique identifier that does not change. *There is no button associated with this attribute, because it is automatically included in every class*.

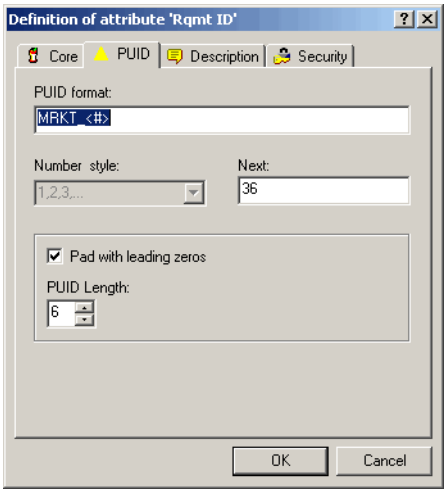

Figure 3-12. Rqmt ID Attribute Definition

The Rqmt ID attribute properties are described in the following table.

Property	Description
PUID format	Any string of characters and then <#>. The <#> variable is replaced by the PUID number. **NOTE:** If you want # to appear in the PUID as a character, type it in the string of characters without the brackets.
Number style	The style of numbering to use for the PUID.
Next	The next PUID number to be assigned.
Pad with leading zeros	Whether zeros precede the PUID to make the PUID number the number specified in the **PUID Length** list.
PUID Length	The number of numbers that can replace the <#> variable.

Classes

Classes act as repositories for the data held in the project. Creating classes involves configuring the attributes of the class to tailor the class for the project-unique information that it will hold, as well as setting up the security profiles for individual groups and users to each of the classes.

CAUTION! The Poll, Chapter, and Comment classes are for internal use only and must not be modified.

Adding a New Class

Adding a class symbol to the Class Definition diagram creates an information class.

To add a class:

1 Click the **Add Class** button , or right-click a blank area of the canvas and select a class from the context menu.

2 Move the cursor to where you want to place the class and click the left mouse button. The class symbol is displayed on the diagram and the title is highlighted for editing.

3 Enter a unique name for the class that describes the data held in the class.

NOTES

- Class names cannot contain spaces, tabs, the @ symbol, or Oracle reserved words. For a complete list of Oracle reserved words, see Knowledgebase Article 5004035, dated 9/19/06.
- Class names must contain at least one alphabetic character.

4 Click a blank area of the canvas to save the new name.

Changing Display Properties for a Class

When a class is added to the project schema, it is added with a default set of properties that relate to the graphic representation used for the class.

To configure the display properties for a class:

- Right-click the class and select **Properties**. The **Component Properties** dialog box opens.

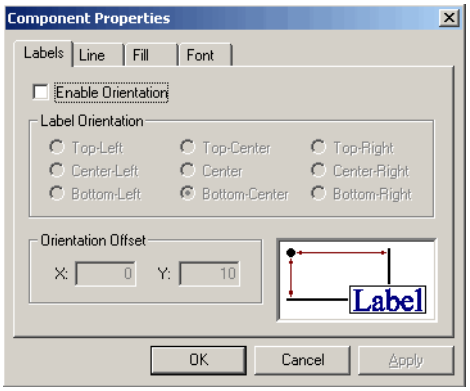

Figure 3-13. Component Properties

The **Component Properties** dialog box consists of four tabs:

- **Labels**—Allows the location of the label to be specified. The **X Offset** and **Y Offset** fields allow the offset of the label to be specified relative to the selected control point. To reposition a class label relative to the bitmap, use the X and Y Offset values rather than dragging the label to its new location. This leaves the label attached to the bitmap so that it will move when the class bitmap is moved. If the label is repositioned by dragging it on the canvas, it will not move when the class

bitmap is moved. To reattach the label, select one of the control points and click **OK** or **Apply**.

- **Line**—Allows the outline for the label to be defined. By default the line is not visible but it can be displayed by clearing the **Transparent** check box.
- **Fill**—Allows the background fill for the class label to be defined. The default is transparent.
- **Font**—Allows the font for the class label to be defined. The font, size, style and color can all be configured on this page.

Changing a Class Image

When a class is added to the project schema it is created with the default image associated with the type definition. The image for a class can be customized to uniquely identify a class on the diagram.

To change the image for a class:

1. Obtain or prepare an image file to be used for the class.

NOTE Class Definition only allows bitmaps of up to 8-bit color.

2. Right-click the class and select **Change Image**.
3. Locate the image file to be used for the class. The image bitmap is displayed in the preview area of the dialog. Bitmaps are the only file types allowed for this procedure.
4. Click **Open**.

Copying a Class

You can copy a class definition to create a duplicate class definition on the project schema diagram. The duplicate class must have a unique name, but will initially contain the same attributes as the original class.

To copy a class:

1. Select the class.
2. Right-click the class and select **Copy**.
3. Right-click the canvas where the class is to be displayed and select **Paste**.

NOTE This does not copy the data associated with the class.

Creating a Class Type from a Class

Class types provide a way to reuse all or part of a class definition within a project schema. You can define a class type from an existing class definition. The class type serves as a template for new class information.

To create a new class type from an existing class instance:

1. Right-click the class.
2. Select **Create as Class Type**. This creates a new class type with the same name as the existing class.
3. Modify the new class type in the **Definition of Class Type** dialog box (see "Defining a Class" on page 139).

Deleting a Class

To delete a class from the project schema:

1. Right-click the class you want to delete.
2. Select **Delete**, or select the class and then press the **Delete** key.

NOTE This will not only delete the class definition from the project schema, but will also delete all data associated with the class. Therefore, use this procedure with caution.

Purging Class Data

To purge the data from a class:

1. Right-click the class and select **Purge**.
2. Select one of the following options:
   - **Deleted Objects** purges all objects that have a status of deleted.
   - **All Objects** purges all objects.
   - **Selected Objects** runs the Batch Update wizard, which allows you to constrain the set of objects to be purged with attribute values.

CAUTION! Purging data permanently removes the objects from the project.

Renaming a Class

To rename a class:

1. Position the cursor over the class title.
2. To select the text, double-click the class title.
3. Type a new name for the class.

NOTES

- Class names cannot contain spaces, tabs, the @ symbol, or Oracle reserved words. For a complete list of Oracle reserved words, see Knowledgebase Article 5004035, dated 9/19/06.
- The class name should describe the data you intend to associate with the class. Each class name must be unique.

4 To commit the name change, click an empty area of the canvas.

Defining a Class

To define a class:

1 Select a class on the Class Definition diagram.

2 Right-click and select **Define**. The **Definition of Class** dialog box opens.

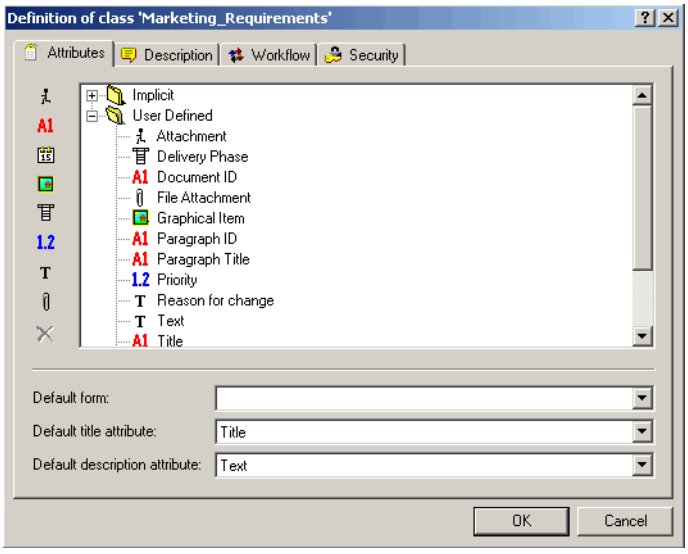

Figure 3-14. Class Definition

This dialog box contains four tabs:

- **Attributes**—Used to manage the attributes of the class
- **Description**—Used to add a description to the class
- **Workflow**—No longer used
- **Security**—Used to create security profiles for the class

Specifying Attributes

Each class has to have the following:

- A default class form
- A default title attribute

- A default description attribute

In RM Browser, Documents View uses the default title attribute and default description attribute to display meaningful data. Only the title for each chapter and requirement is displayed in the navigation tree. In the paragraph layout, the title, description, and any additional attributes that were selected in the **Properties** dialog box are displayed.

The default title attribute and default description attribute are also displayed in the prebuilt queries in Home View, in the query results from running a quick search from Requirement View, and in the detail pane for a selected requirement in Traceability View.

For more information about these views, see the *Serena Dimensions RM Browser User's Guide*.

To specify values on the Attributes tab:

1. In the **Default form** list, select the form that RM Concept uses as the default form. For more information, see "Working with Forms" on page 68.
2. In the **Default title attribute** list, select an attribute. All alphanumeric attributes that are defined for the class are listed. You must set the default title attribute to an existing alphanumeric attribute or create a new alphanumeric attribute if none is available.
3. In the **Default description attribute** list, select an attribute. All text attributes that are defined for the class are listed. You must set the default description attribute to an existing text attribute or create a new text attribute if none is available.

NOTE For information about defining individual attributes, see "Attributes" on page 126.

Specifying a Description

The Class Definition tool allows a description to be associated with all items defined in the project schema. Use this field to clarify items. For example, an attribute, "Build Version" might have the description "Enter the build version in which the feature was released."

1. Double-click the class.

   The **Definition of class** dialog box opens.
2. Click the **Description** tab.
3. Type the description.

Specifying Security

For information about specifying security, see "Security" on page 155.

Relationships

A relationship represents a logical association between two classes. The two classes are referred to as the primary class (the class from which the relationship flows), and the secondary class (the class to which the relationship flows).

Adding a New Relationship

Adding a relationship to the Class Definition diagram creates a link between two classes allowing the traceability or flow of information to be created between objects of the classes. A relationship can be created in one of three ways:

- Click the **Add Relationship** button and move the cursor over one of the classes to be linked. Click the left mouse button to start the relationship and then trace the route of the relationship by moving the mouse and clicking the left mouse button to create a vertex. Finally, click on the destination class with the left mouse button to complete the relationship.
- Right-click a blank area of the canvas and select **Add Relationship**. Move the cursor over one of the classes to be linked. Click the left mouse button to start the relationship and then trace the route of the relationship by moving the mouse and clicking the left mouse button to create a vertex. Finally, click the destination class with the left mouse button to complete the relationship.
- Move the cursor over one of the classes to be linked and press the left mouse button while holding down the control key. Trace the route of the relationship by moving the mouse and clicking the left mouse button to create a vertex. Finally, click on the destination class with the left mouse button to complete the relationship.

The relationship will appear on the diagram and the name will be highlighted. Enter a unique name for the relationship which describes the data which will be held in the relationship, and click on a blank area of the canvas to commit the new name.

NOTES

- Relationship names cannot contain spaces, tabs, the @ symbol, or Oracle reserved words. For a complete list of Oracle reserved words, see Serena Support Knowledgebase Article 5004035, dated 9/19/06.
- Do not create a relationship from any class to a Chapter class.
- You cannot put more than one Chapter class into a diagram.

Changing the Display Properties for a Relationship

When a relationship is added to the project schema, it is added with a default set of properties that relate to the label style used for the relationship.

To configure the display properties for the relationship label:

1 Right-click the relationship and select **Properties**. The **Component Properties** dialog box opens.

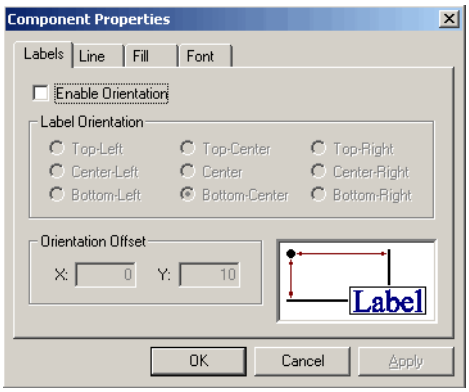

Figure 3-15. Component Properties

The **Component Properties** dialog box consists of four tabs.

- **Labels**—Allows the location of the label, relative to the bitmap, to be specified. The X Offset and Y Offset fields allow the offset of the label to be specified relative to the selected control point. In order to reposition a relationship's label relative to the bitmap, you should use the X and Y Offset values instead of dragging the label to its new location. This will still leave the label attached to the bitmap so that it will move when the relationship's bitmap is moved. If the label is reposition by dragging it on the canvas it will no longer move when the relationship's bitmap is moved. To reattach the label, select one of the control points above and click **OK** or **Apply**.
- **Line**—Allows the definition of the outline for the label to be defined. By default the line is transparent (that is, not visible) but it can be displayed by clearing the **Transparent** check box.
- **Fill**—Allows the background fill for the relationship's label to be defined. Once again the default is for a transparent background.
- **Font**—Allows the font used for the relationship's label to be defined. The font, size, style and color can all be configured on this page.

2 Specify properties.

3 Click **OK**.

Deleting a Relationship

Deleting a relationship not only deletes the relationship definition from the project schema. It also deletes all links associated with the relationship and should be used with caution.

To delete a relationship from the project schema:

1 Right-click the desired relationship.

2 Either select **Delete** from the context menu or press the Delete key.

Editing Vertices

When a relationship is selected, Class Definition places control handles on every vertex that defines the relationships shape. These vertices can be manipulated to change the path of a relationship.

Moving a Vertex

To move a vertex:

1. Select the relationship.
2. Hover your cursor over a control handle. The cursor changes ✥ to signal that you can move this vertex.
3. Click the control handle and then drag it to a new position.
4. Release the mouse button to place the vertex at its new coordinates.

Inserting a Vertex

To insert a vertex:

1. Select the relationship.
2. Move your cursor between two control points and hold down the Control key. The cursor changes ✥ to signal that you can insert a vertex.
3. Click to place the vertex on the line segment.

Removing a Vertex

To remove a vertex:

1. Select the relationship.
2. Move your cursor over a vertex and hold down the Control key. The cursor changes × to signal that you can delete the vertex.
3. Click to delete the vertex from the component.

Purging Relationship Data

CAUTION! Purging data permanently removes links from the project.

To purge the links from a relationship:

1. Right-click the relationship.
2. Select one of the following:
   - **Purge | Deleted** to purge deleted links.
   - **Purge | All** to purge all links.

Renaming a Relationship

The relationship name should describe the data you intend to associate with the relationship. Each relationship name must be unique to the diagram. Names can include any printable character with the exception of spaces, tabs, or the @ symbol.

To rename a relationship:

- Double-click the relationship name.

To commit the name change:

- Click on a blank area of the canvas.

Reversing a Relationship

If the information does not seem to flow in the direction that the relationship was initially created, you can reverse it.

To reverse a relationship:

1. Right-click the relationship and select **Reverse**.
2. Select one of the following options. The selected option is applied to all existing links when the relationship is reversed.
   - **Retain Links**—Reverses the direction of the relationship while leaving all existing links in place.
   - **Remove Links**—Reverses the direction of the relationship, and removes all existing links for the relationship.

Defining a Relationship

To define a relationship:

- Right-click the relationship and select **Define**.

The **Definition of relationship** dialog box opens.

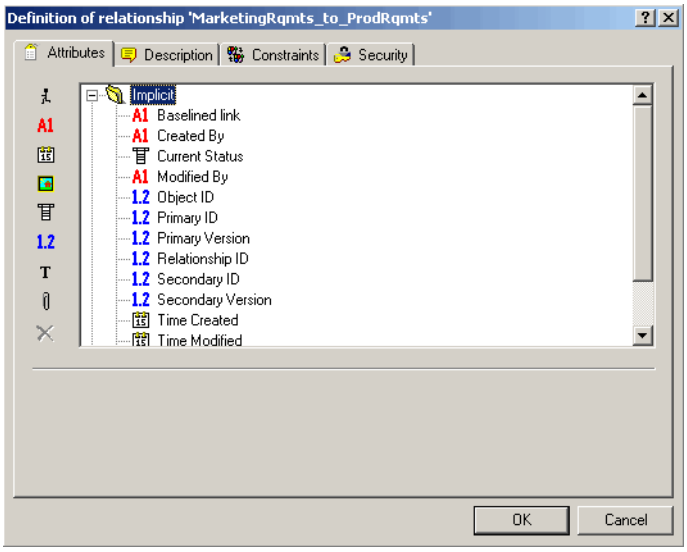

Figure 3-16. Relationship Definition

This dialog box has four tabs:

- **Attributes**—Used to manage the attributes of the relationship
- **Description**—Used to add a description to the relationship
- **Constraints**—Used to add constraints to the relationship
- **Security**—Used to create security profiles for the relationship

Specifying Attributes

For information about specifying attributes, see "Attributes" on page 126.

Specifying a Description

The Class Definition tool lets you describe all items defined in the project schema. Use descriptions to clarify a particular item. For example, an attribute or build version may have a description of "Enter the build version in which the version was released."

1 Right-click the object and select **Define**.

2 The **Definition of relationship** dialog box opens.

3 Click the **Description** tab.

4 Type the description.

Specifying Constraints

Relationship rules enable you to specify the properties of a relationship. You can constrain the creation of links by the user, and also specify the actions to be performed when either the primary or secondary objects participating in a relationship are edited.

To add constraints to a relationship:

1 Right-click the relationship and select **Define**.

The **Definition of relationship** dialog box opens.

2 Click the **Constraints** tab.

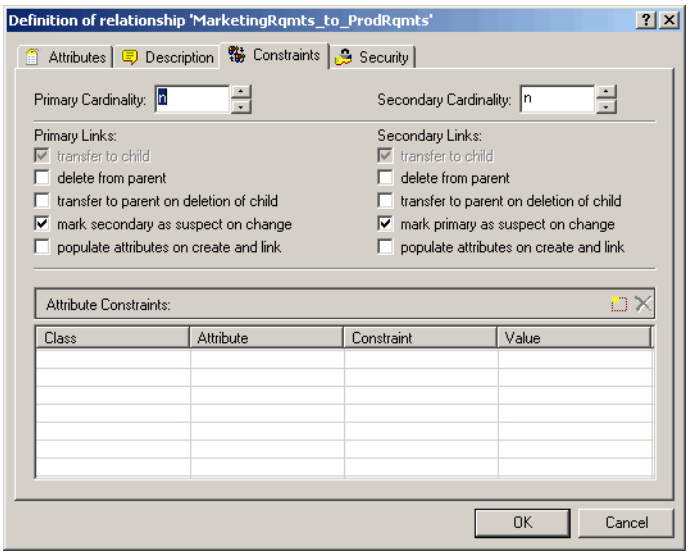

Figure 3-17. Definition of Relationship—Constraints Tab

3 Specify the constraints as described in the following sections.

4 Click **OK**.

Cardinality

Cardinality rules control the number of links that you can make between objects of the classes in a relationship. For example, a cardinality of 2:3 (2 for the primary cardinality and 3 for the secondary cardinality) means that no more than two links can be made from an object of the primary class to objects of the secondary class. Also, no more than three links can be made from an object of the secondary class to objects of the primary class. To indicate that links cannot be made to objects of either the primary or secondary class, enter a value of 0 in the appropriate field. To indicate that the number of links created to objects of the either the primary or secondary class should be unconstrained, enter a value of **n** in the appropriate field.

Constraints

Relationship constraints allow rules to be created that govern the creation of links between objects of the primary and secondary class.

To add a new constraint:

1 Click the **New Constraint** button .

A new row is added to the table.

2 Select a cell and select the class, attribute, and operator from the drop-down list.

3 Enter the value into the fourth column for the rule. If the selected attribute is a list, select the value from the list of values displayed; otherwise, type the value into the text box.

4 Click **OK**.

To delete a constraint:

1 Highlight the row and click the **Delete** button .

2 Click **OK**.

To change an existing constraint rule:

1 Click the cell to be changed and modify the value.

2 Click **OK**.

Transfer Rules

Transfer rules govern what happens to an object link if you edit an object participating in the relationship. Toggling the desired values on or off sets the link transfer rules.

The following table describes the types of link transfer rules.

Rule Type	Description
Primary links transfer to child	When the primary object in the relationship is edited and a new object is created (the child object), the links from the primary object are copied to the child
Primary links delete from parent	When the primary object in the relationship is edited and a new object is created (the child object), the links from the primary object are deleted.
Primary links transfer to parent on deletion of child	When the child object is deleted in the primary class, links to the primary object are transferred to the parent.
Secondary links transfer to child	When the secondary object in the relationship is edited and a new object is created (the child object), the links from the secondary object are copied to the child
Secondary links delete from parent	When the secondary object in the relationship is edited and a new object is created (the child object), the links from the secondary object are deleted.
Secondary links transfer to parent on deletion of child	When the child object is deleted in the secondary class, links to the object are transferred to the parent.

Suspect Link Rules

Suspect link rules allow you to mark each side of a specific relationship as suspect when changes occur. If the **mark secondary as suspect on change** check box is selected under **Primary Links**, all secondary links of the relationship type are marked as suspect if the primary object changed. If the **mark primary as suspect on change** check box is selected under **Secondary Links**, all primary links of the relationship type are marked as suspect if the secondary object changed.

When you select either of these check boxes, the **transfer to child** check box is automatically selected.

Note the following:

- Any attribute change causes an object to be marked as suspect.
- There is no relationship between the transfer rules and the suspect link rules; however, they are processed at the same time.
- The object itself is marked as suspect as well as the link. If the object is replaced and it does not have the links transferred, it is no longer linked to the suspect object; however the suspect flag on the object itself still needs to be cleared.

Populate Attributes Rule

In some situations it is desirable to populate the attributes of a new object with the values of the attributes of another object. For example, suppose you have a `TestCaseTemplate` class, and you want to use it as a template for all test cases.

To populate the attributes of a new object with the attributes of an existing object:

1. Create a new class (for example, `TestCase`) and create a relationship from the `TestCaseTemplates` class to the new class.
2. Edit the relationship in the **Definition of relationship** dialog box in Class Definition. (In this example, you would select the **populate attributes on create and link** check box for the secondary link.)
   - If the **populate attributes on create and link** check box is selected for the secondary links, the attributes for the object that is secondary in the relationship are populated with attributes based on values in the primary object that already exists.
   - If the **populate attributes on create and link** check box is selected for the primary links, the attributes for the object that is primary in the relationship are populated with attributes based in the values in the secondary object that already exists.
   - If the **populate attributes on create and link** check box is selected for both the primary and secondary links, the attributes are populated depending on whether you are linking to the primary object or the secondary object.

NOTES

- Only attributes with the same internal name and the same type are populated.
- The default behavior is for the **populate attributes on create and link** check box to be cleared.
- This behavior might not be desirable for all relationships in the schema.

Specifying Security

For information about specifying security, see "Security" on page 155.

Class Types

This section describes how to work with class types.

Defining a Class Type

To define a class type:

1 Right-click a blank place in the grid.

2 Select **Add Class** | **Manage class types**.

The **Manage Class Types** dialog box opens.

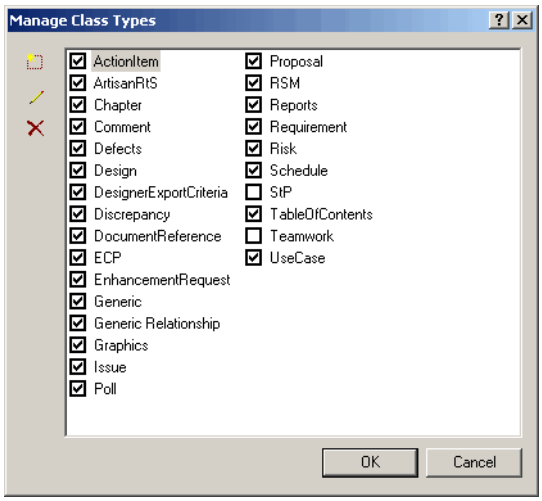

Figure 3-18. Manage Class Types

A selected check box indicates that the class type is valid and can be added to the project schema.

3 Click **OK**.

Adding a New Class Type

To add a new class type definition:

1 Click the **Add** button on the **Manage Class Types** dialog box. The **New Class Type** dialog box opens.

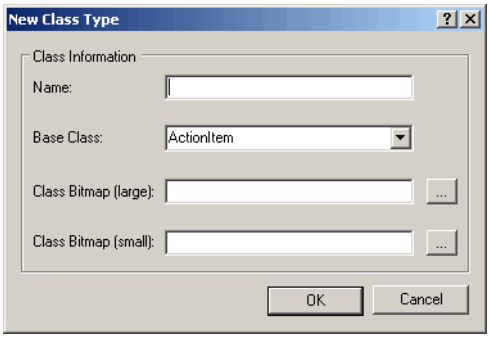

Figure 3-19. New Class Type

2 Specify properties as described in the following table.

Property	Description
Name	The name of the class type.
Base Class	The class type from which the new class is derived. To create a new class type that has no attributes defined yet, you should derive the class from the Generic class, which contains only the attributes that all class types must have.
Class Bitmap (large)	The large class bitmap field points to the file that is used by Class Definition as the default symbol on the schema diagram.
Class Bitmap (small)	The small class bitmap field points to the file that is used by the Dimensions RM tools to identify the class type.

Deleting a Class Type

To delete a class type from the project schema:

1 Select the type on the **Manage Class Types** dialog box.

2 Click the **Delete** button .

NOTE This only removes the type definition. It does not affect any class instances for this type.

Editing a Class Type Definition

To edit an existing class type definition:

1 Select the class type on the **Manage Class Types** dialog box.

2 Click the **Edit** button .

NOTE This only affects the class type definition. It does not affect any existing class instances of this type.

The **Definition of class** dialog box opens.

Specifying Attributes

For information about specifying attributes, see "Attributes" on page 126.

Changing the Class Definition Bitmap

Class Definition allows the user to define the image that is used on the schema diagram as well as associate a small bitmap that will be used by the other tools to identify the class type.

To change the image:

1 Right-click the image and select **Change Image**.

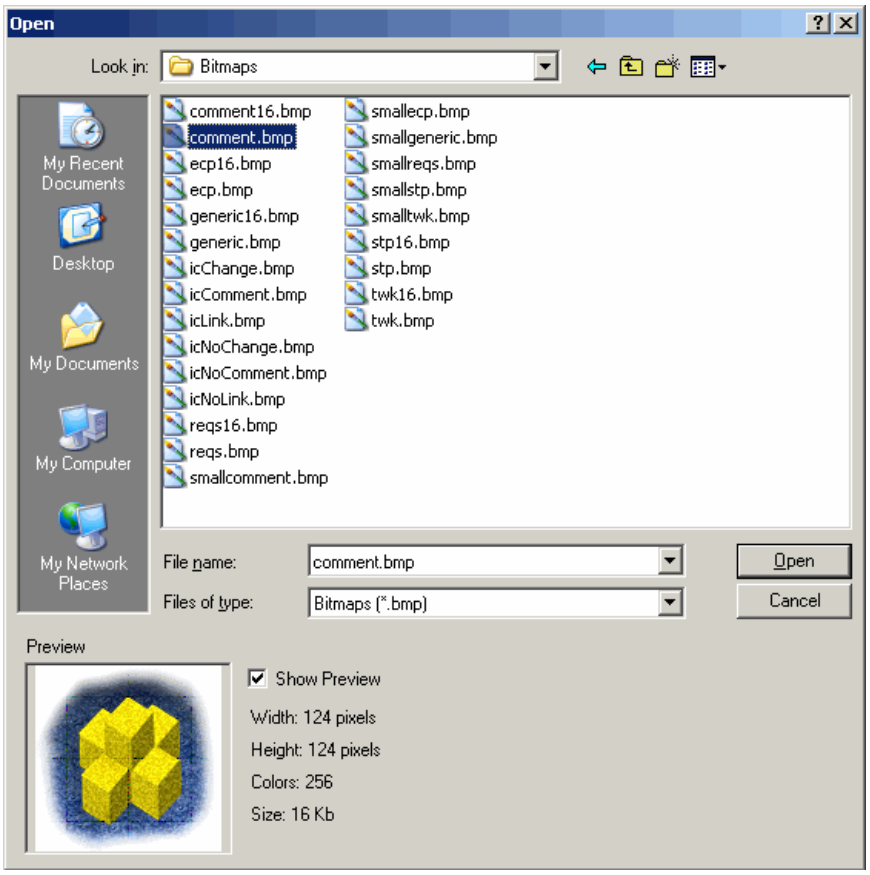

Figure 3-20. Class Type Definition Visual

2 Locate the Windows bitmap file containing the image. A preview of the bitmap appears on the main property page.

NOTE There are no constraints on the size of the bitmap, but for performance, the size should be reasonable and the image should only be up to 8-bit color.

Changing the Class Icon

To change the icon used to represent a class type, click **Open** to the right of the **File name** list and locate the Windows bitmap file. A preview of the bitmap is displayed on the main property page. The bitmap should be 16x16 pixels and 8-bit color.

NOTE Only bitmaps of up to 8-bit color can be used.

Changing the Label Properties for Class Types

To change the default properties for the label associated with a class type:

1 Right-click the object and select **Properties**. The **Component Properties** dialog box opens.

2 Click the **Labels** tab.

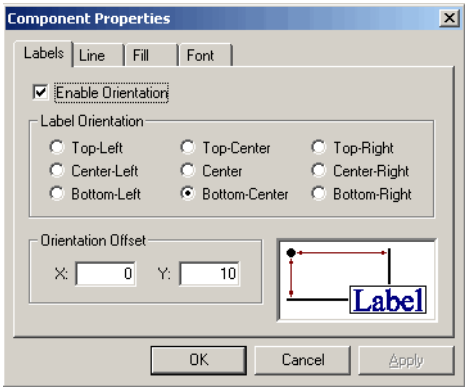

Figure 3-21. Component Properties

3 Customize the format of the label for the class type.

Source Documents

Dimensions RM allows you to work with various document formats, including ASCII and Microsoft Word. However, before objects can be captured and engineered from these documents, they must first be registered with Dimensions RM. This can be done in Class Definition, RM Word, or RM Manage.

Adding a New Source Document

To add a new source document to the project:

1 Do one of the following:

- Select **Edit** | **Source Documents**.
- Click the **Source Documents** button .

The **Source Documents** dialog box opens.

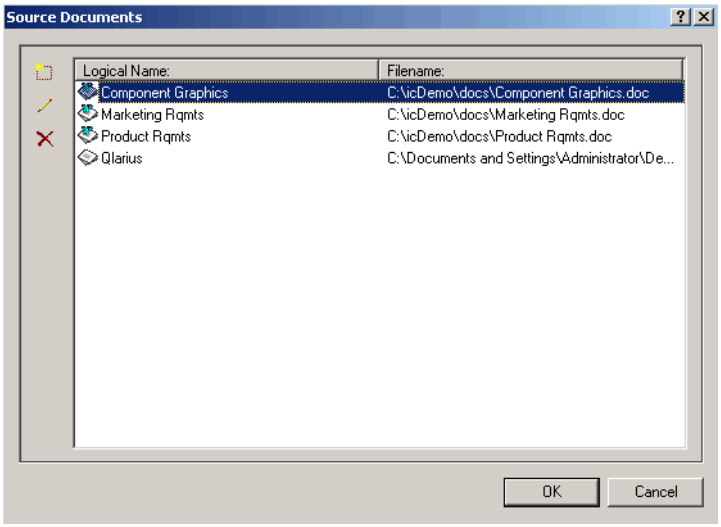

Figure 3-22. Source Documents

2 Click the **New** button .

The **Definition of source document** dialog box opens.

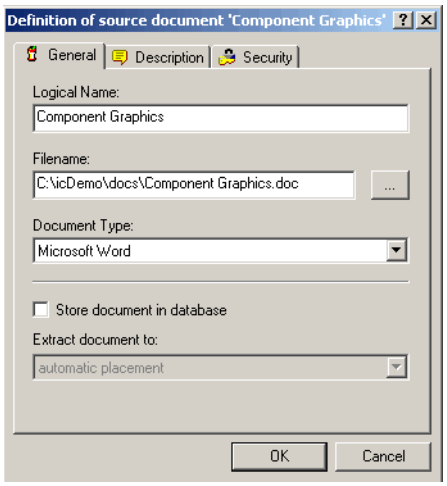

Figure 3-23. Definition of Source Document

3 To select a file, click the browse button. (Dimensions RM refers to this name in the captured attributes.)

NOTE You can also type the document path and name in the **Logical Name** field.

4 Select a document type from the following options:

- Unknown
- ASCII
- Microsoft Word

5 To store documents in the database, select the **Store document in database** check box. Documents can be stored in the following areas:

- Automatic placement
- User's home directory
- Original document directory
- Dimensions RM temporary directory
- System temporary directory

6 Click **OK**.

Deleting a Source Document

To delete a source document from the project:

1 Do one of the following:

- Select **Edit** | **Source Documents**.
- Click the **Source Documents** button .

2 Select the document to be removed from the project.

3 Click the **Delete** button .

Editing a Source Document

To edit a source document:

1 Do one of the following:

- Select **Edit** | **Source Documents**.
- Click the **Source Documents** button .

2 Click the **Edit** button . The **Definition of source document** dialog box opens (see Figure 3-23, "Definition of Source Document," on page 153).

3 Click the **General** tab and edit the document properties as described in the following table.

Property	Description
Logical Name	The name by which the document will be known to Dimensions RM. The Logical Name must be unique.
Filename	The name of the file to register with Dimensions RM. This should include the full path to the file.
Document Type	The type of file that is being registered with Dimensions RM so that the document can be handled correctly.

Property	Description
Store document in database	If checked, the source document will be stored in the project database. Otherwise, the file will be held on the local file system and may not be accessible to all users.
Extract document to	If the source document is stored in the database a location must be selected from the list to determine where to place the source file when it is extracted from the database.

4 Click the **Description** tab.

The Class Definition tool allows descriptions to be associated with all items defined in the project schema. The descriptions add clarification to the particular item. For example, a build version might have a description of "Enter the build version in which the feature was released."

5 Click the **Security** tab and enter properties. For information about entering properties, see "Security" on page 155.

Security

NOTES As a good general practice, Serena recommends that no Dimensions RM group or user (including Administrators) ever be granted the class access rights for: REMOVE, UPDATE, and UPDATE NON_CURRENT.

Update should not be granted to anyone on the system. All requirements changes should be performed with the replace function. This approach allows a fully auditable change history to be maintained and thus exposes Dimensions RM full capabilities. But this approach does require that you baseline requirements to capture the versions that you are currently capturing with the replace button. If users start using baselines and snapshots with other usage models (primarily updates and replace to version), they will be forced to create a new version just because someone else created a baseline. This may also limit the compare functions in Dimensions RM.

Access rights are associated with each resource defined in a Dimensions RM database. Access rights determine if you can perform a task on a target resource.

Class Definition allows the project administrator to grant or deny access to resources defined in the project schema. This includes all classes, relationships, attributes and source documents. The list of valid transactions for each of these different resources will vary (see the appropriate table in this section for specific details about the transactions available for each resource type), but the method for defining the security profile is the same. If the project administrator does not grant or deny access to a specific resource in Class Definition, the default access defined in RM Manage for the resource category will be used.

NOTE The security constraints placed on any individual entity in class definition will apply to that entity only. Use RM Manage to apply more general security policies across the entire project.

Granting Group Access

To change the access of a group to the selected resource:

1 Right-click the resource and select **Define**.

2 Click the **Security** tab.

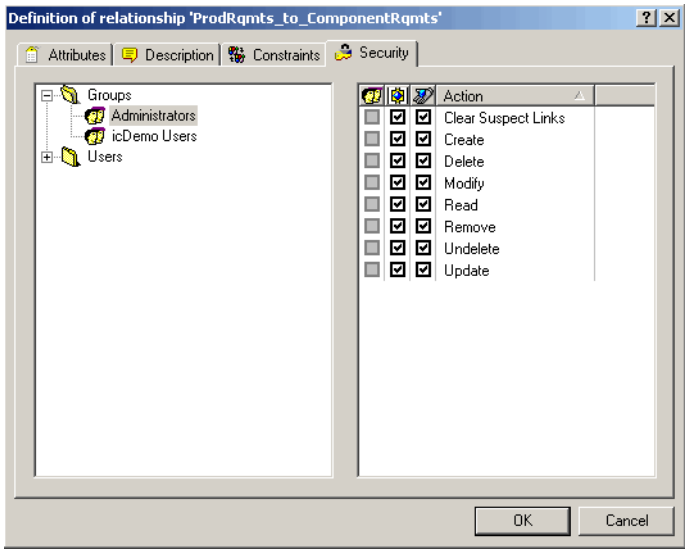

Figure 3-24. Definition of Relationship—Security Tab

3 Click + next to **Groups**.

4 Select the group.

5 Click the required transaction to toggle the access rights. For group access rights the group is allowed ☑ or denied ☐ access.

6 Click **OK**.

7 Save the project schema.

Granting User Access

To change the access of a user to the selected resource:

1 Right-click the class and select **Define**.

2 Click the **Security** tab.

3 Click + next to **Users**.

4 Select the user.

5 Click the required transaction to toggle the access rights. For user access rights, the user can be granted one of three access levels:

- Explicit access is indicated by a checked box ☑
- Explicit denial is indicated by an unchecked box ☐
- Inherited access is indicated by a grayed box ▢.

6 Click **OK**.

7 Save the project schema.

Order of Precedence

The use of groups and the ability to allow and disallow users from access to a resource make it possible that a user may be both allowed and denied access to a specific resource. To resolve this potential conflict, an order of precedence is used by the Dimensions RM security system. The order of precedence (from highest precedence to lowest precedence) is shown in the following table.

Source of Access	Allowed Status
An individual user has been explicitly denied access to a resource or transaction.	Denied
An individual has been granted explicit access to a resource or transaction.	Allowed
An individual has been granted access to a resource or transaction through membership in a group that has been granted access.	Allowed
An individual has been explicitly denied access to an entire category of resources through default access rights.	Denied
An individual has been explicitly allowed access to an entire category of resources through default access rights.	Allowed
An individual has been allowed access to an entire category of resources through membership in a group that has been granted access rights to a category of resources.	Allowed
No entries exist specifying access rights for the individual or any groups of which the individual is a member in the access rights list.	Denied

Valid Transactions

The tables in the following sections list the valid transactions for classes, relationships, and source documents.

Valid Transactions for Classes

The following table lists the valid transactions for classes and describes what the transactions allow a user or group to do.

Transaction	Description
CM Lock	Define the class object as CMLocked (configuration management locked).
Create	Create objects for the class.
CreateCR	Create new change requests for objects in the class. **NOTE:** To create change requests, a user or group must have explicit access to the "CreateCR" and "Read" actions at the class level, and to the "Read" action at the relationship level.

Transaction	Description
Delete	Mark the class objects as deleted.
Generated Form	Create forms.
ExecuteCR	Accept or reject change requests.
Expand	Expand class objects.
Focus	Focus class objects.
Link	Create generic links to the class objects.
Read	Read the class objects.
Remove	Remove the class objects.
Replace	Replace the class objects.
Undelete	Undelete the class objects.
Unlock	Unlock the class objects that are locked.
Update	Update the class objects with a status of Current.
Update NonCurrent	Update the class objects with a status other than Current.

Valid Transactions for Relationships

The following table lists the valid transactions for relationships and describes what the transactions allow a user or group to do.

Transaction	Description
Clear Suspect Links	The user can clear the "suspect" flag on suspect links.
Create	The user can create a link across the relationship(s) if the class also has corresponding link access granted.
Delete	Not currently implemented.
Modify	Not currently implemented.
Read	Read links and relationship names.
Remove	Remove the link without keeping a record of it.
Undelete	Not currently implemented.

Valid Transactions for Source Documents

The following table lists the valid transactions for source documents and describes what the transactions allow a user or group to do.

Transaction	Description
Capture	Capture class objects from documents.
Create	Register new documents.
Read	View registered documents.
Remove	Unregister documents.
Unlock	Unlock documents.

Saving the Project Schema

To save the project schema, select **File** | **Save** or click the **Save** button.

If there are one or more users currently working with other tools in the project you have changed, the **Tool Locks** dialog is displayed, identifying the names and computers of the current users, as well as the tools they are using.

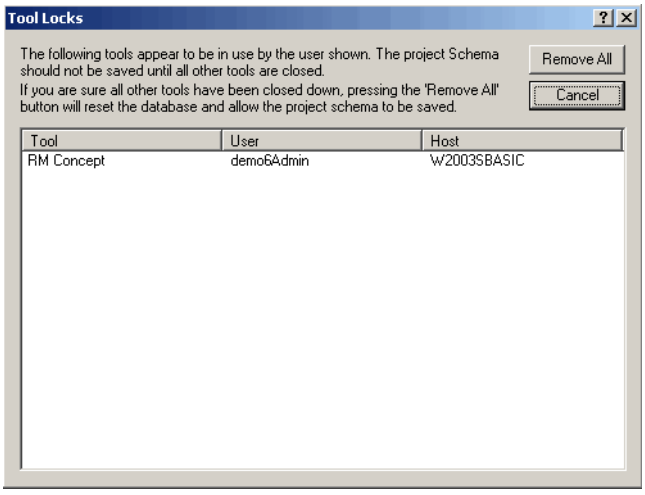

Figure 3-25. Tool Locks

You can cancel the save operation until other users have finished working, or you can click **Remove All** to remove the tool locks. This allows you to save the project schema, but it may adversely effect the operations being performed by the other users.

Reloading the Project Schema

If changes have been made to the project schema since the last save operation, you can discard them by selecting **File** | **Reload**. This discards all changes and reloads the project schema. If you are a project administrator, **Reload** locks the project schema so that changes can be made.

Releasing the Project Schema Lock

If the project schema is loaded in read/write mode and you do not want to make changes, the schema lock can be released by selecting **Release Lock** from the **File** menu. This allows another user to make changes to the project schema while you are still able to view the read-only version. If any changes have been made, you will be warned that the changes will be lost, and will be allowed to save the changes or cancel the operation.

Exporting the Project Schema

You can export the project schema to a *dump* file so that it can be used as a template for another project. Project data is not exported.

To export the project schema:

1. Select **File** | **Export Definitions**.
2. Click **Yes**.
3. Enter a file name and select the directory in which you would like to store the exported file.
4. Click **Save** to export the file.

Printing the Project Schema Diagram

To print the project schema:

1. Select **File** | **Print** or click the **Print** button .
2. Select print options.
3. Click **OK**.

Printing the Project Schema Definitions

You can print definitions for each of the classes and relationships to a printer or to an RTF file.

To print project schema definitions:

1. Select **Print Definitions** from the **File** menu.
2. Select the definitions you would like to print.
3. Click **Next**.
4. Select how you would like to print the definitions. You have four types of options: class, relationship, form, and source document. These options allow you to select which class or relationship definitions will be printed, and which data will be printed.
5. Click **Next**.
6. Click **Print**.
7. Click **Finish** to exit.

NOTE On the preview page you can choose to save the output to an RTF file, which can subsequently be formatted using an RTF-capable editor such as WordPad.

Implementing Suspect Links

To implement the suspect links feature, use Class Definition to define constraints and security on relationships.

NOTE For detailed information about the suspect links feature, see the *Serena Dimensions RM Browser User's Guide*.

To implement the suspect links feature:

1. Specify suspect link constraints on the relationships that you want to participate in the suspect links feature. For more information, see "Specifying Constraints" on page 145.
2. Specify the **Clear Suspect Links** action for each user and group that should have permission to clear suspect links. For more information, see "Security" on page 155.

Implementing Documents View

To implement the Documents View perspective, use Class Definition to add a Chapter class to the project. Do not create any relationships between this class and other classes.

NOTE For detailed information about Documents View, see the *Serena Dimensions RM Browser User's Guide*.

Defining the Date Format

When you define a date attribute in the **Date Attribution Definition** dialog box, the display format for the date can also be defined. This format will be used for both displaying the date attribute, and validating the date attribute when entering a new value.

To define the date format:

- Select or type a format in the **Display Format** box.

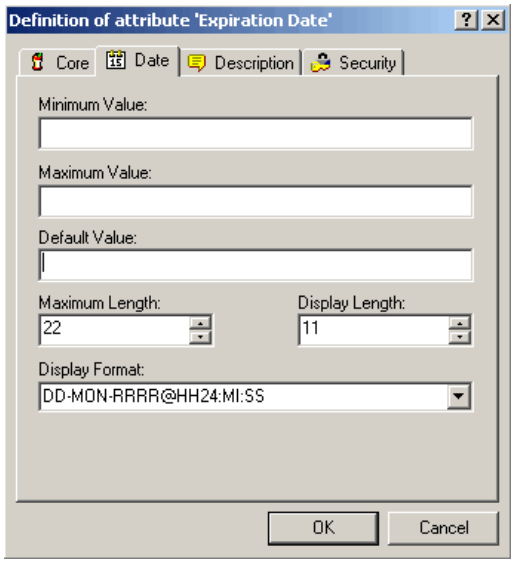

Figure 3-26. Date Attribute Definition Dialog

Date Format Elements

When entering a new date any of the format elements shown below can be used, but format items cannot appear twice and also format items that represent similar information cannot be combined. For example, you cannot use "SYYYY" and "BC" in the same format string.

Element	Meaning
D	Day of week (1-7)
J	Julian day; the number of days since January 1, 4712 BC. Numbers specified with "J" must be integers.
Q	Quarter of year (1,2,3,4; 1=January—March)
W	Week of month (1-5) where week 1 starts on the first day of the month and ends on the seventh
AD A.D.	A.D. indicator with or without periods
AM A.M.	Meridian indicator with or without periods

Element	Meaning
BC B.C.	B.C. indicator with or without periods
PM P.M.	Meridian indicator with or without periods
CC SCC	Century; "S" prefixes BC dates with "-"
DD	Day of month (1-31)
DY	Abbreviated name of day
IW	Week of year (1-52 or 1-53) based on the ISO standard
MI	Minute (0-59)
MM	Month (01-12; Jan=01)
RM	Roman numeral of month (I-XII; Jan=I)
WW	Week of year (1-53) where week 1 starts on the first day of the year and continues to the seventh day of the year
SS	Second (0-59)
DAY	Name of day, padded with blanks to length of 9 characters
DDD	Day of year (1-366)
MON	Abbreviated name of month
IYY IY I	Last 3, 2 or 1 digit(s) of the ISO year
YYY YY Y	Last 3, 2, or 1 digit(s) of year
Y YYY	Year with comma in this position
HH HH12	Hour of the day (1-12)
HH24	Hour of the day (0-23)
MONTH	Name of month, padded with blanks to length of 9 characters
IYYY	4-digit year based on the ISO standard
RRRR	4-digit year; allows entry of 2 digit year and calculates century based on the 2 digit year value entered. See "RRRR Date Format Elements" on page 164. **NOTE:** This is the preferred format for 4-digit years.
SSSSS	Seconds past midnight (0-86399)
YEAR SYEAR	Year spelled out; "S" prefixes BC dates with "-"
YYYY SYYYY	4-digit year; "S" prefixes BC dates with "-"

Date Format Element Suffixes

The following table lists suffixes that can be added to date format elements:

Suffix	Meaning	Example Element	Example Value
TH	Ordinal Number	DDTH	4TH
SP	Spelled Number	DDSP	FOUR
SPTH or THSP	Spelled, Ordinal Number	DDSPTH	FOURTH

When you add one of these suffixes to a date format element, the return value element is always in English.

NOTE Date suffixes are only valid on output and should not be used when entering a date (for example, a date attribute with the format defined as "DDTH Mon, YYYY" will be displayed as "12th Jan, 1999" but should be entered as "12 Jan, 1999").

Capitalization of Date Format Elements

Capitalization in a spelled-out word, abbreviation, or Roman numeral follows capitalization in the corresponding format element. For example:

- "DAY" produces "MONDAY"
- "Day" produces "Monday"
- "day" produces "monday"

RRRR Date Format Elements

The RRRR date format element is similar to the YYYY date format element, but it provides additional flexibility for storing date values in other centuries when you enter a two-digit year. For example, it allows you to store twenty-first century dates in the twentieth century when you specify only the last two digits of the year.

The following table describes the behavior of the RRRR date format element.

Last Two Digits of Current Year	Digits Entered in Oracle	Century in which Date is Created
00–49	00–49	Current
	50–99	Prior
50–99	00–49	Next
	50–99	Current

The following table provides examples of this behavior.

Current Year	Digits Entered in Oracle	Date Created
2004	09	2009
	99	1999
2094	09	2109
	99	2099

Punctuation and Character Literals in Date Format Models

You can also include these characters in a date format model:

- Punctuation marks such as hyphens, slashes, commas, periods, and colons
- Character literals

These characters appear in the displayed value in the same location as they appear in the format model, and must be entered in the same location for a new date value to be valid.

Chapter 4

RM Import Designer

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What is RM Import Designer?

RM Import Designer allows you to design templates that users select when importing Microsoft® Word documents into Serena® Dimensions® RM. Templates define how to identify classes, attributes, chapters, requirements, and categories. Templates can be saved to the database for future use. You must be knowledgeable about class types and the structure of the Word documents that will be imported.

The RM Import tool allows users to preview a Word document, change the description of chapters, reorganize the chapters, change the values of attributes, move attributes between chapters, and so on. When satisfied with the document, users can import it into Dimensions RM as a document that can be viewed and edited from Document View.

IMPORTANT!

- Word uses unique, proprietary styles and formatting; therefore, the styles and formatting of the Word document (for example, lists, bullets, and fonts) are not necessarily preserved in Document View. However, the text is always imported, so there is no data loss.
- You cannot import the changes you make in Document View back into the original Word document. Roundtripping between Dimensions RM and Word is not supported.
- Documents in Document View are *not* the same as the Word documents from which they were imported. Dimensions RM does *not* store the Word document; it parses the data into classes (requirements and so on) so the data is available to the entire project.
- Users can optionally import directly using RM Browser, without having to first design an import template. Please see the *Dimensions RM Browser User's Guide* for more on importing using the RM Browser client.

For more information about RM Import, see the "RM Import" chapter of the *Serena Dimensions RM Windows Clients User's Guide*. For more information about Document View, see the *Serena Dimensions RM Browser User's Guide.*

Note the following:

- Everything in the Word document up to the first heading, except for the Table of Contents, becomes the document description. The document description is captured as an HTML-enabled attribute and can include tables, images, and so on.
- Chapters are automatically captured based on Word headings.
- All subheadings become subchapters until and unless they are later identified as requirements.
- RM Import attempts to import the bodies of the chapters that are not identified as requirements into the description of the chapter. This helps ensure that all data from the Word document is captured.
- Chapters do not need to contain any requirements.
- You can import the requirements from the documents into one class or multiple classes. However, each chapter can contain requirements from only one class.
- Microsoft Office 2007 SP1 or newer, Microsoft Office 2003 SP3 or newer, or Microsoft Office XP must be installed on the Dimensions RM server to support Document

Publishing, RM Import, and RM Import Designer tools; and additionally on the client Word must be installed to support RM Import.

The minimum set of pre-installed Microsoft Office components required for the above tools is:

- Microsoft Office Excel.
- Microsoft Office Excel .NET Programmability Support.
- Microsoft Office Word.
- Microsoft Office Word .NET Programmability Support.

The following should also be noted:

- A message warns you if you do not have Office installed on your computer.
- Microsoft Office 2010 is not currently supported.
- For consistent and reproducible use of the Document Publishing, RM Import, and RM Import Designer tools, it is advisable to ensure that all users use the same version of Microsoft Office.
- If you import requirements using the Word import feature in the RM Browser client, Word XP or 2003 must be installed on the server to correctly import graphics from ".doc" files; Word 2007 must be installed to import graphics in ".docx" files.
- To be able to view Microsoft Word OLE-linked or embedded attachments when using Dimensions RM Document Publishing, the Windows user concerned must have been assigned administrator rights. This is a general Microsoft Word pre-requisite for utilizing OLE-linked or embedded attachments.
- If Microsoft IIS is used as the Web Server for RM import and RM Import Designer, the IUSR anonymous user account must have read and execute access to the Microsoft Office components for RM Browser Import applications to function correctly.

- RM Import needs the PIA (Primary Interop Assembly) that is installed by default. No special permissions are required. Before you use RM Import, be sure that Word is activated (that is, open Word at least once before using RM Import).
- The RM Import installation configures the user to run as an interactive user; no other permissions are required. Make sure that any other program associated with the Word document is activated (for example, if you publish a Word document with a .pdf attachment, make sure that Adobe® Reader® is activated on the server).

IMPORTANT! Before you prepare a template that will be used to import a Word document, save the document as HTML and examine the results. This is the way the document will be displayed in RM Browser after it is imported. If you see any formatting problems that are unacceptable (for example, problems with lists, bullets, and fonts), adjust the styles used in the Word document until the results are satisfactory.

CAUTION! If you do not enable the Description attribute for HTML, then formatting and images are not imported. For instructions for enabling the Description attribute for HTML, see "Text Attribute" on page 134.

Logging in to RM Import Designer

Logging in to RM Import Designer is a two-part process:

- Validating the server
- Logging in to the Dimensions RM project

The server validation must occur before you can log in to a Dimensions RM project. If you are using secure socket layers (SSL), which is an advanced security feature, a certificate selection dialog may be displayed during the server validation. The situation in which this dialog is displayed is discussed later in this procedure.

NOTE Before you log in, you must know the URL or name and port number (if not 80) of the server running the RM Web service, and have access to at least one project running on that service.

To log in to RM Import Designer:

1 Do one of the following:

- Select **Start** | **Programs** | **Serena** | **Dimensions RM** ***version*** | **RM Import Designer**.
- Double-click the RM Import Designer shortcut on your desktop.

The **RM Import Designer login** dialog box opens.

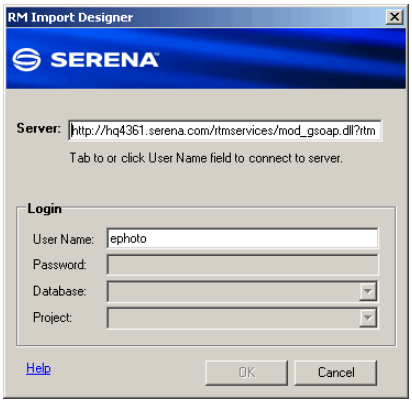

Figure 4-1. Login Dialog

2 In the **Server** field, type the name of the server that hosts the RM Web service. You can type a full URL or just type the server name and then press the Tab key, and the default URL is built. If the port number is not 80, type the port number after the server name, separated by a colon.

An example URL is `http://PC2040/rtmservices/mod_gsoap.dll?rtmservice`

NOTES

- The default URL works for both Apache and IIS servers.
- It is a good practice to copy the complete URL that is in the **Server** field to the address bar of a Web browser window and test that it connects to the server on which your Web service is hosted. This is a good test for http and https to validate that the Web service is up and running.

If your URL includes `https://` for SSL, an additional dialog box can be displayed that lets you choose which personal certificate you want to use. This dialog box is displayed if more than one certificate is in your personal store.

NOTES

- This dialog box shows personal certificates only.
- The certificate information is not cached, so you are prompted for a certificate every time you log in.

3 The **User Name** field is populated with the last value you entered, if any. If necessary, type your user name.

NOTES

- The server connection is attempted when you click on or tab to the **User Name** field.
- The **Password**, **Database**, and **Project** fields are enabled only after the server is connected.

4 In the **Password** field, type your password.

5 In the **Database** field, select the Dimensions RM database from which you want to work.

6 In the **Project** field, select the project with which you want to work.

NOTE The projects in the list are those that you have permission to log in to. If no projects appear in the list, then either an error occurred or you do not have permissions for any project on the server.

7 Click **OK**.

The **RM Import Designer** window opens to the **General** tab.

NOTE If you receive an HTTP 401 authentication error when you attempt to log in, see "Publishing a Document with File Attachments from a Separate Server" on page 221.

Commands

The following sections describe how to perform the commands that are available on the RM Import Designer toolbar.

Opening an Existing Template

To open an existing template:

1 Click **Open** on the RM Import Designer toolbar.

The **Open Template** dialog box opens.

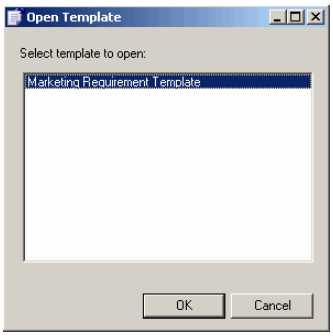

Figure 4-2. Open Template

2 Select the template you want to open and click **OK**.

Creating a New Template

To create a new template:

1 Click **New** on the RM Import Designer toolbar.

The number of the template in the title bar and in the **Name** field is incremented by one.

2 Complete the tabs in RM Import Designer as described in this chapter.

3 Click **Save** on the RM Import Designer toolbar.

Saving a Template

To save a template:

- Click the **Save** button on the RM Import Designer toolbar.

Saving a Template with Another Name

To save a template with another name:

1 Click **Save As** on the RM Import Designer toolbar.

The **Save As** dialog opens.

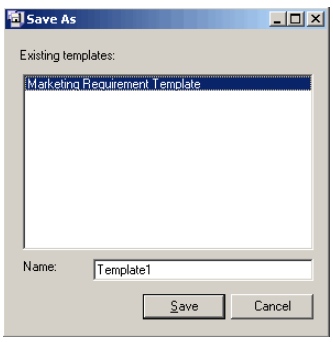

Figure 4-3. Save As

2 To save this template with another name, type the name in the **Name** field.

3 Click **Save**.

Deleting a Template

To delete a template:

1 Open the template you want to delete.

2 Click **Delete** on the RM Import Designer toolbar.

3 Confirm the deletion in the confirmation dialog box that opens.

General Tab

After you log in to RM Import Designer, the **RM Import Designer** dialog box opens to the **General** tab.

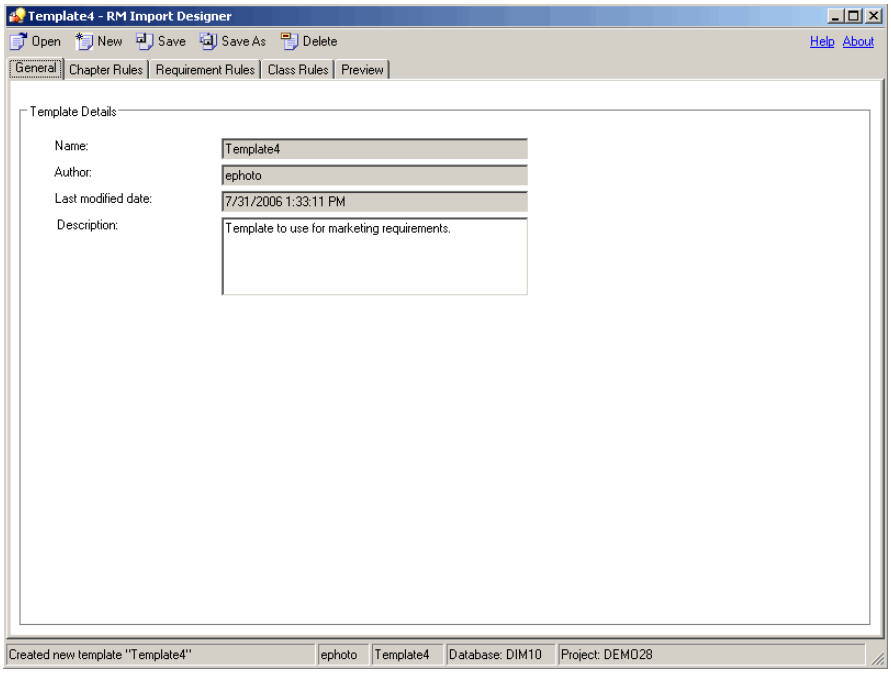

Figure 4-4. General Tab

To complete the General tab:

1 **Name** is a read-only field that contains the name of the template. When you create the template, the name is Template<*n*>, where <*n*> is the next numbered template. You can change the name by clicking **Save As** and typing a new file name.

2 **Author** is a read-only field that contains the user name of the person who created the template. If this is a new template, this field contains the user name of the person who just logged in to RM Import Designer.

3 **Last modified date** is a read-only field that contains the date and time that the template was created or saved. For a template that has not yet been saved, this field contains the date and time that the user logged in.

4 In the **Description** field, type an optional description of the template. Any description you type in this field is displayed in import mode, and helps the user determine which template to select for the import.

Chapter Rules Tab

The **Chapter Rules** tab gives you choices for identifying chapters. Chapters are captured automatically according to Word headings, similar to the way Word builds a table of contents. The automatic capture of headings as chapters helps maintain the structure and organization of documents.

NOTE By default, all headings are captured as chapters. If the requirement rules identify these headings as requirements, then the requirement rules take precedence and the headings and subheadings are identified as requirements.

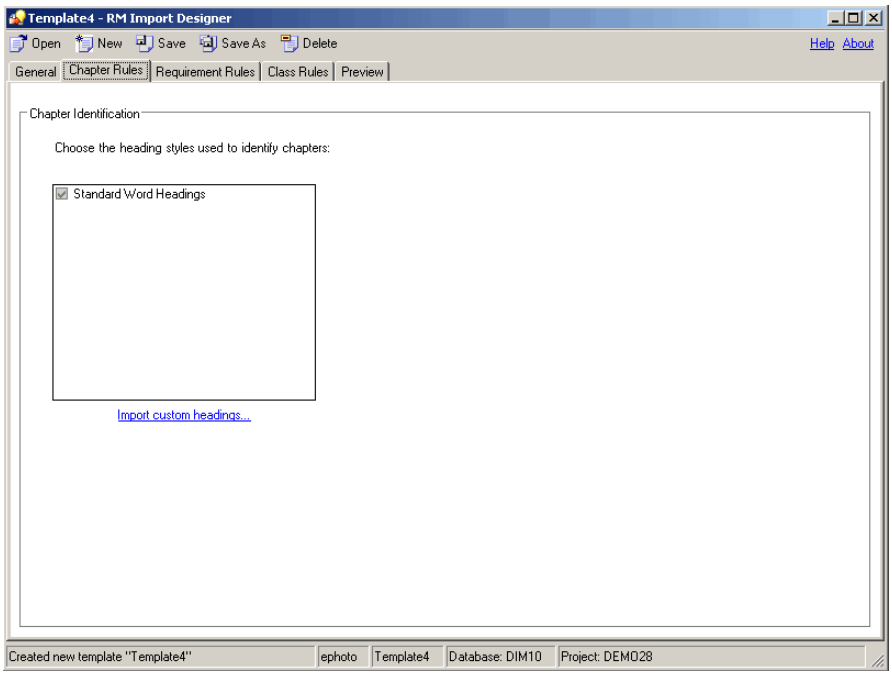

Figure 4-5. Chapter Rules Tab

NOTE If the document you are importing uses custom headings (headings other than the standard nine Word headings), you can load the headings from the document and select the ones you want to use in the document. The same list of custom headings are presented on the **Requirement Rules** tab.

To complete the Chapter Rules tab:

1 If you want to use custom heading styles in addition to standard Word headings to identify the beginning of a chapter in a document, click **Import custom headings**. The **Open** dialog box opens.

2 Type or browse to the Word document from which you want to load heading styles, and click **Open**.

The custom headings from the document are displayed in the list box.

3 Select the custom headings that you want to use to identify chapters.

Requirement Rules Tab

The **Requirement Rules** tab is used to identify the requirements in the document, and varies depending on the option you select under **Requirement Identification**. Each option presents a pattern in which requirements can be identified. The option you select affects the attribute patterns available on the **Class Rules** tab.

NOTES

- You can use the **Preview** tab to see how each option affects the import.
- A red exclamation mark indicates that a mandatory default value must be specified.

Table Option

The choices presented with the **Table** option allow you to distinguish rows in tables that contain requirements from those that do not. Use the **Table** option if requirements are in table rows.

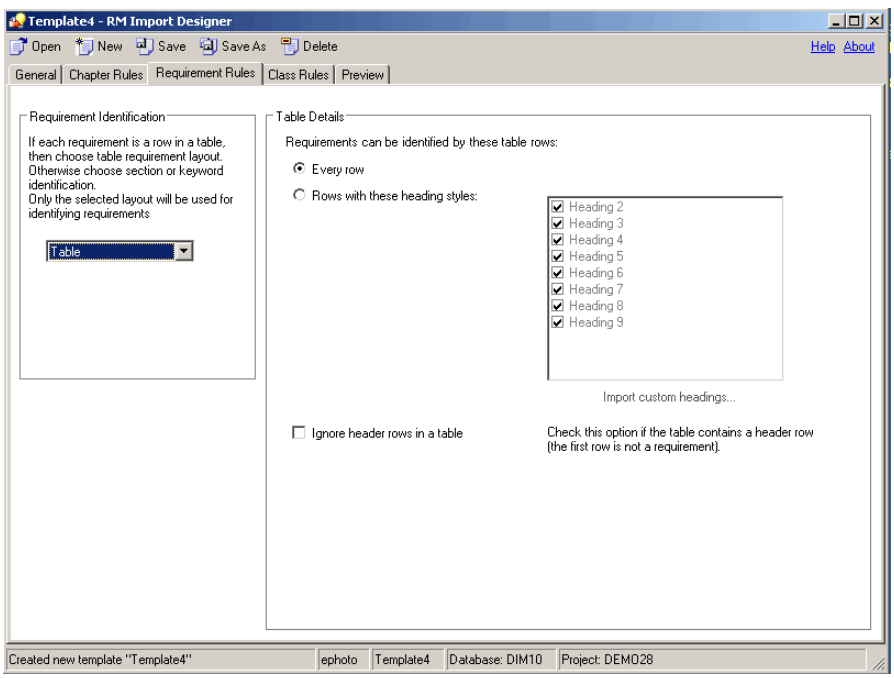

Figure 4-6. Requirement Rules Tab—Table Layout

To complete the Requirement Rules tab for the Table option:

1 Under **Requirement Identification**, select **Table**.

2 Under **Table Details**, select one of the options described in the following table.

Option	Description
Every row	Select this option for documents in which all tables contain requirements.
Rows with these heading style	Select this option when a requirement is in a table with a table cell containing a standard Word heading style. Tables that do not contain a heading are not identified as containing requirements and become part of the chapter description. If you want to use custom headings, click **Import custom headings**, and type to or browse to the Word document from which you want to load custom styles. Select those headings that you want to use to identify requirements. **NOTE:** If you imported custom headings on the **Chapter Rules** tab, this list is automatically populated with the headings from the document you specified there.

3 Select the **Ignore header rows in a table** check box if the table contains a header row (that is, the first row in the table contains the names of columns and not a requirement).

Section Option

Use the **Section** option to identify sections of the Word document that contain requirements.

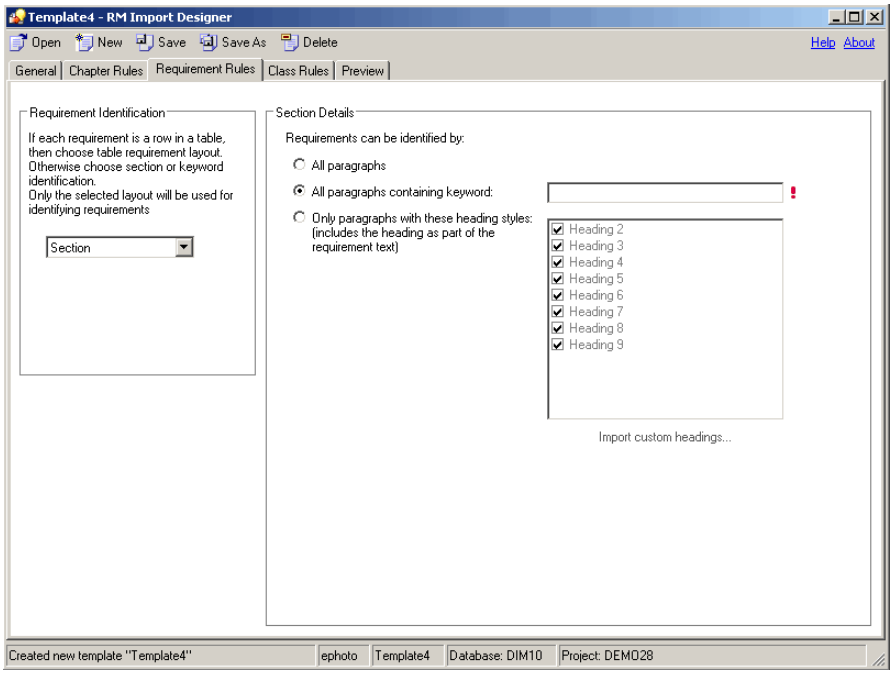

Figure 4-7. Requirement Tab—Section Option

To complete the Requirement Rules tab for the Section option:

1 Under **Requirement Identification**, select **Section**.

2 Under **Section Details**, select one of the options described in the following table.

Option	Description
All paragraphs	Select this option to identify every paragraph in a chapter as a requirement. This option is useful for numbered lists, bulleted lists, and so on.
All paragraphs containing keyword	Select this option to identify every paragraph in the chapter as a requirement only if it contains the keyword or keywords you type in the field. *Shall, will,* and *must* are examples of keywords you could type here. You can also type regular Word expressions in this field. For examples of regular Word expressions, see "Word Regular Expressions" on page 191. **NOTE:** When there is information between two paragraphs that contain keywords, that information is captured into the first requirement. To perform an OR search, separate multiple keywords with spaces. If you want to search for an exact string, enclose multiple keywords in quotation marks. To perform a customized search, use a regular expression.
Only paragraphs with these heading styles...	Select this option to identify any block of text with a specific heading style as a requirement. The heading is included as part of the requirement. If you want to include custom headings, click **Load custom headings** and type or browse to the Word document from which you want to load custom styles. Select those headings that you want to use to identify requirements. **NOTE:** If you imported custom headings on the **Chapter Rules** tab, this list is automatically populated with the headings from the document you specified there.

Keyword Option

If requirements cannot be identified using the table or section rules, you can specify a pattern using a keyword or Word regular expression that identifies requirements. The pattern can span paragraphs and the first match of the "begin pattern" keyword represents the beginning of the requirement. You can identify an entire table representing a requirement using this option.

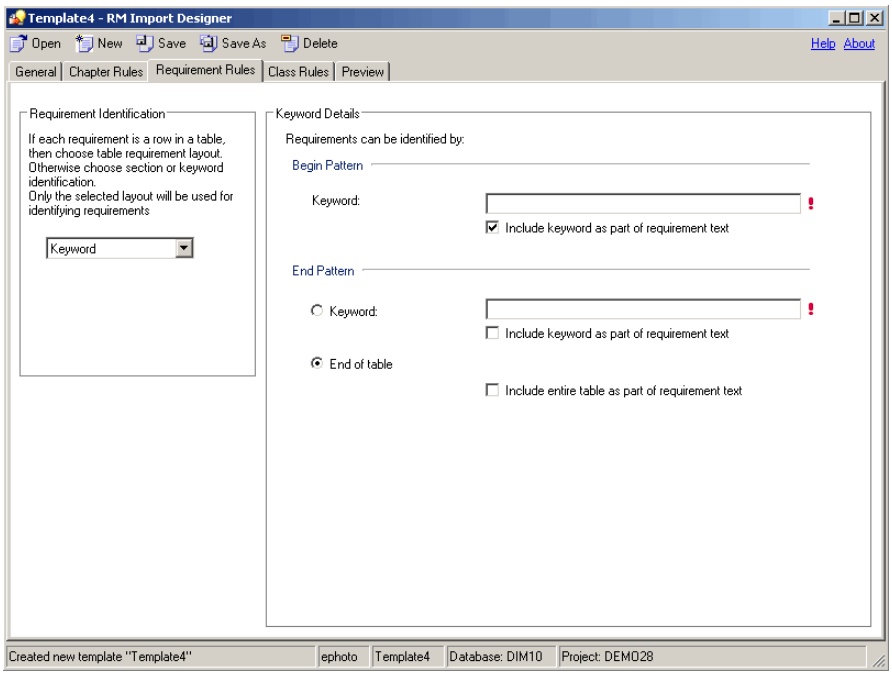

Figure 4-8. Requirement Tab—Keyword Option

To complete the Requirement Rules tab for the Keyword option:

1 Under **Requirement Identification**, select **Keyword**.

NOTES

- Keywords are case sensitive. To search for either case, type both words in the **Keyword** box, separated by a space. For example, type **design Design**.
- To perform a customized search, use a regular expression. For information about regular expressions, see "Word Regular Expressions" on page 191.

2 Under **Begin Pattern**, type the keyword or keywords or Word regular expression that marks the beginning of the requirement. If you want to include the keyword as part of the requirement, select the **Include keyword as part of requirement text** check box.

This field is mandatory.

3 Under **End Pattern**, do one of the following:

- Select **Keyword** and type the keyword or keywords or Word regular expression that marks the end of the requirement. If you want to include the keyword as part of the requirement, select the **Include keyword as part of requirement text** check box.
- Select **End of table** if the beginning keyword is before the table and the entire table after the beginning keyword represents a requirement. If you want to include the entire table as part of the requirement, select the **Include entire table as part of requirement text** check box.

Class Rules Tab

The **Class Rules** tab allows you to identify classes in a document and set up default attributes and categories. By default, the title and description attributes and other attributes that are specified as "mandatory" in Class Definition are included in each class.

RM Import attempts to capture everything that is not a requirement as the chapter description. It attempts to capture portions of a requirement that are not captured into any attribute into the default Description attribute of that class.

CAUTION! If you do not enable HTML formatting for the default Description attribute or any other text attribute, then formatting and images are not imported. For instructions for enabling HTML for text attributes, see "Text Attribute" on page 134.

CAUTION! If you delete a class that is referenced in a template from Class Definition, or remove "read" permission for it, the template becomes invalid.

NOTE If the entire requirement can be captured into the default Description attribute, then you do not have to make any additional choices on the **Class Rules** tab.

Class Information

NOTE A red exclamation mark indicates that a mandatory default value must be specified.

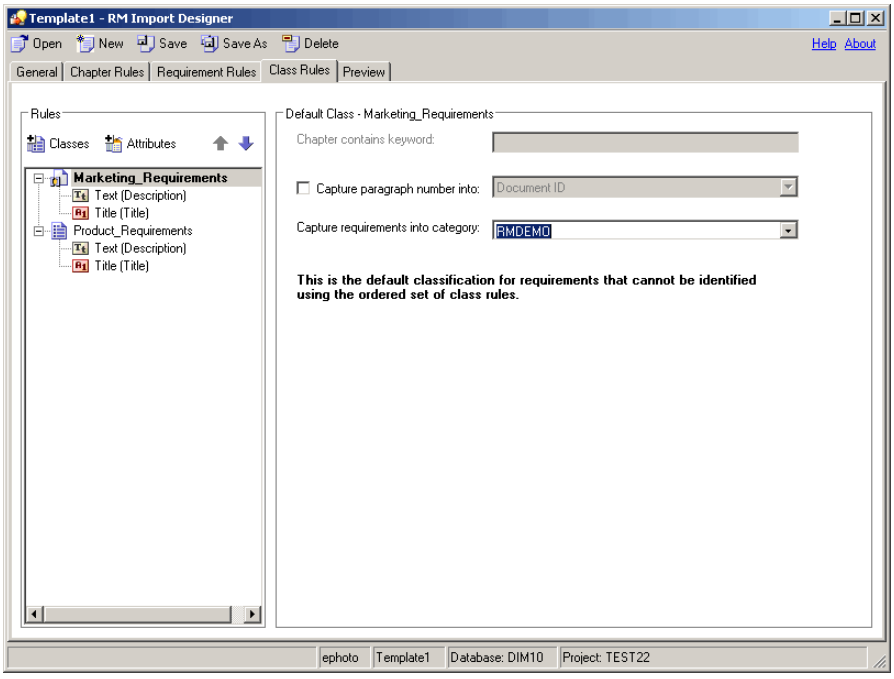

Figure 4-9. Class Rules Tab—Default Class

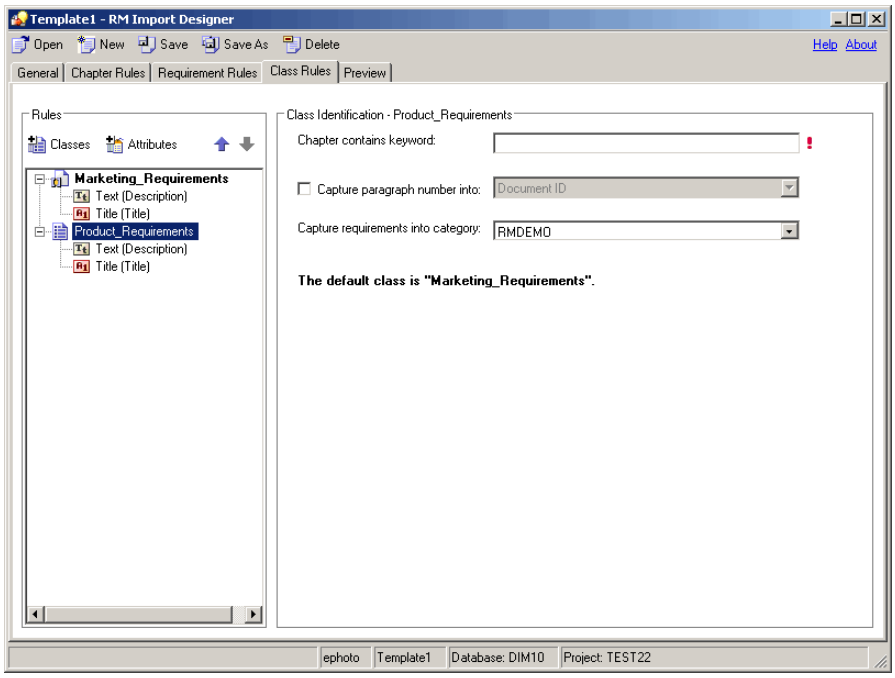

Figure 4-10. Class Rules Tab—Non-Default Class

To complete the Class Rules tab for a class:

1 Do one of the following:

- If you are creating a new template, the **Add/Remove Class Rules** dialog box automatically opens when you click the **Class Rules** tab. Proceed to the next step.
- If you need to change the classes that are included in an existing template, click **Classes**, or right-click in the left pane and select **Add/Remove Classes**.

  The **Add/Remove Class Rules** dialog box opens.

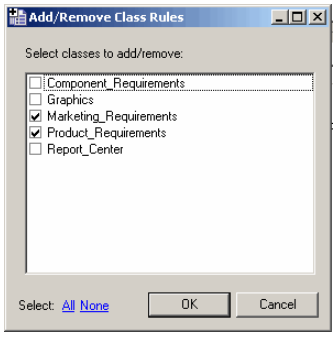

Figure 4-11. Add/Remove Class Rules

2 A set of class types that are defined for the project are listed. Select the classes into which you want to import requirements and click **OK**. To select all of the classes, click **All** at the bottom of the dialog box and click **OK**.

3 By default, the first class listed in the **Add/Remove Class Rules** dialog box becomes the default class for all requirements, and is displayed in boldface type. To change the default class, select the class you want as the default class, right-click in the left pane, and click **Mark as default**.

NOTE You can define only one default class for each template.

4 To remove a class, click the **Classes** button, or right-click in the left pane and select **Add/Remove Classes**. In the **Add/Remove Class Rules** dialog box that opens, clear the check box for the class and click **OK**.

Alternatively, you can right-click the class in the left pane and click **Remove**.

5 Each chapter that contains requirements is searched for keywords. In the **Chapter contains keyword** box, type the keyword or Word regular expression that identifies the class. If there is a match, then requirements found in the chapter are imported as requirements of that class.

This is important when multiple classes can be identified from the document. The keywords are searched in the order in which the classes are specified in the **Add/Remove Class Rules** dialog. To reorder the classes, select the class and then click the up or down arrow in the left pane.

NOTES

- The **Chapter contains keyword** field is disabled for the default class, because all requirements found in the document are of the same class.
- To perform a customized search, use a regular expression. For information about regular expressions, see "Word Regular Expressions" on page 191.

6 If you want to import the paragraph ID (for example, 5.3.2) into an attribute, select the **Capture Paragraph Number into** check box and select the attribute from the list.

7 Select the category to which the requirement will belong from the **Capture requirements into category** list. The default is the root category (the project). The category that you select respects the category permissions for the user.

Attribute Information

When a class in the left pane is expanded, you can select an attribute and specify how the attributes within a requirement are identified, specify default values, and so on. The information in the right pane varies depending on the **Requirement Identification** option selected on the **Requirement Rules** tab, and the type of attribute that is selected. The option that was selected on the **Requirements Rules** tab is displayed at the top of the **Class Rules** tab when an attribute is selected in the left pane.

CAUTION! If you delete an attribute that is referenced in a template from Class Definition, the template becomes invalid.

NOTES

- The same region within a requirement can be captured into multiple attributes. For example, the third column in a table can be captured into more than one attribute.
- A red exclamation mark indicates that a mandatory default value must be specified. The title and description attributes always require default values, as well as attributes that are marked as mandatory in Class Definition.

Adding and Removing Attributes

To add and remove attributes from a class:

1. Select the class to which you want to add attributes.
2. Click **Attributes**, or right-click in the left pane and click **Add/Remove Attributes**.

   The **Add/Remove Attributes** dialog box opens. All of the attributes that are defined for the class are listed.

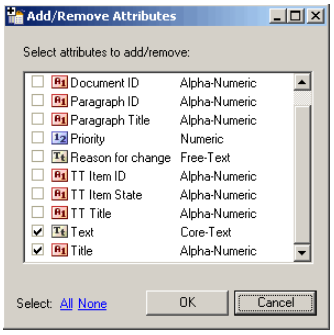

   Figure 4-12. Add/Remove Attributes

3. Select the attributes that you want to add and click **OK**. To select all attributes, click **All** at the bottom of the dialog box and click **OK**.
4. To remove an attribute, click **Attributes**, or right-click the attribute in the left pane and click **Add/Remove Attributes**. In the **Add/Remove Attributes** dialog box that opens, clear the attribute check box and click **OK**. To remove all attributes, click **None** at the bottom of the dialog box and click **OK**.

NOTE Default and mandatory attributes for the selected class are always selected and cannot be removed.

Alphanumeric Attributes with Section or Keyword Option

The following illustration shows the **Class Rules** tab for alphanumeric attributes with the Section or Keyword option:

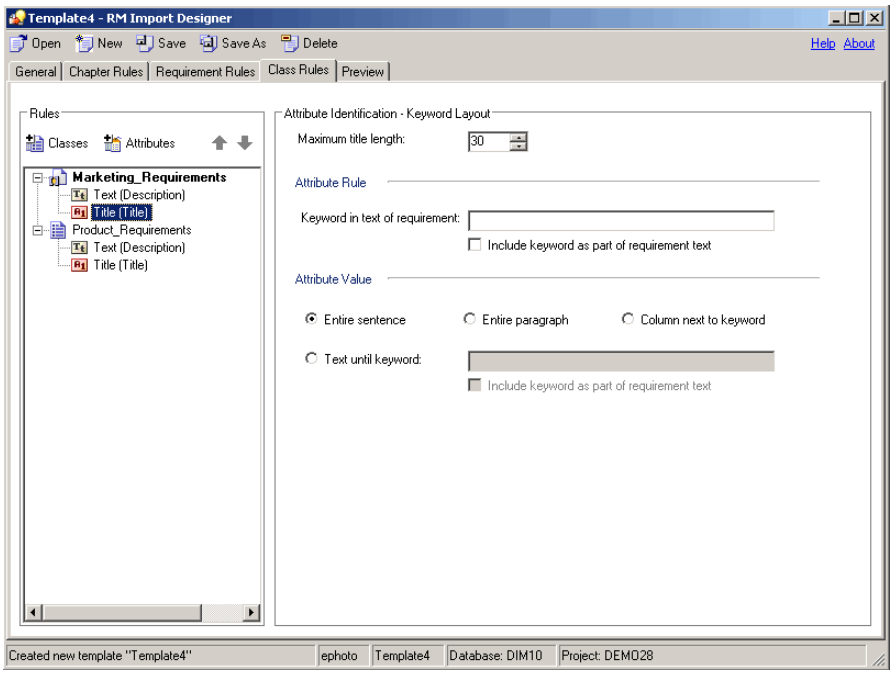

Figure 4-13. Class Rules Tab—Section or Keyword Option—Alphanumeric Attributes

To complete the Class Rules tab for alphanumeric attributes with the Section or Keyword option:

1 In the **Maximum title length** field, select the number of characters for the attribute title. The default value is **30**.

2 In the **Keyword in text of requirement** field, type the keyword, keywords, or Word regular expression to identify the attribute. If you want to include the keyword as part of the requirement, select the **Include keyword as part of requirement text** check box. If no rule is specified in this field, by default the first 30 characters are captured as the title.

NOTE To perform a customized search, use a regular expression. For information about regular expressions, see "Word Regular Expressions" on page 191.

3 Under **Attribute Value**, specify one of the options described in the following table:

Option	Description
Entire sentence	The entire sentence in which the keyword is found is the attribute value.
Entire paragraph	The entire paragraph in which the keyword is found is the attribute value.

Option	Description
Column next to keyword	The requirement includes a table, and the entire content of the cell to the right of the first cell containing the keyword is the attribute value. When the cell that contains the keyword is the last cell in a row, the content of the first cell in the next row is the attribute value. **NOTE:** This does not pertain to the Table option.
Text until keyword	The text up to the specified keyword is the attribute value. Select the **Include keyword as part of requirement** check box if you want to include the keyword in the attribute value. The default is to exclude the keyword.

Alphanumeric Attributes with Table Option

The following illustration shows the Class Rules tab for alphanumeric attributes with the Table option:

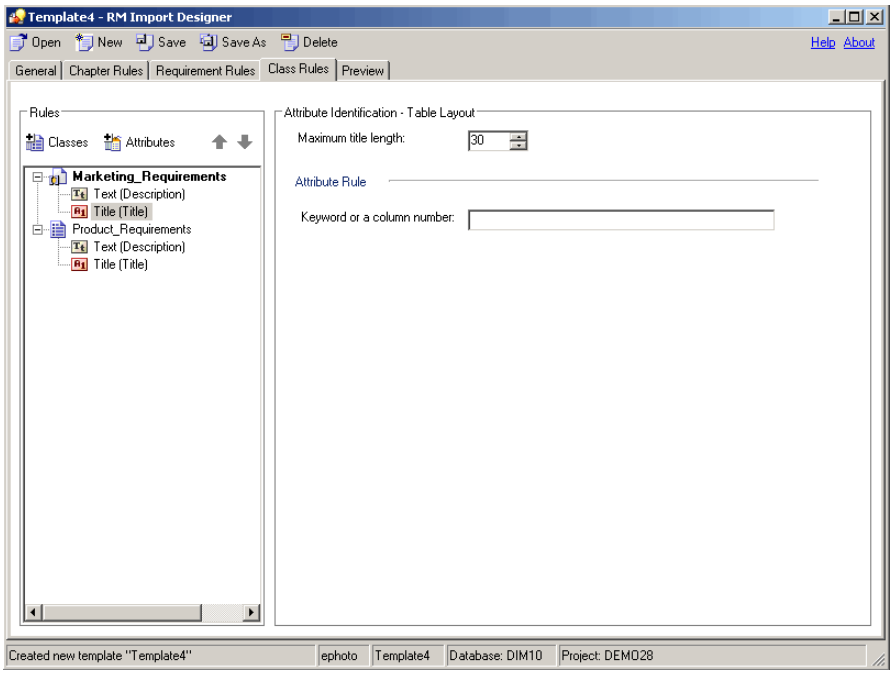

Figure 4-14. Class Rules Tab—Table Option—Alphanumeric Attributes

To complete the Class Rules tab for alphanumeric attributes with the Table option:

1. In the **Maximum title length** field, select the number of characters for the attribute title. The default value is **30**.

2. In the **Keyword or column number field,** type the keyword or column number to identify the attribute. For example, if the **Priority** attribute is in the third column, you could specify `3`. The information specified in the cell below the column heading represents the value of the attribute (for example, `High`). If no rule is specified in this field, by default the first 30 characters are captured as the title.

Text or Numeric Attributes with Section or Keyword Option

The following illustration shows the **Class Rules** tab for text or numeric attributes with the Section or Keyword option:

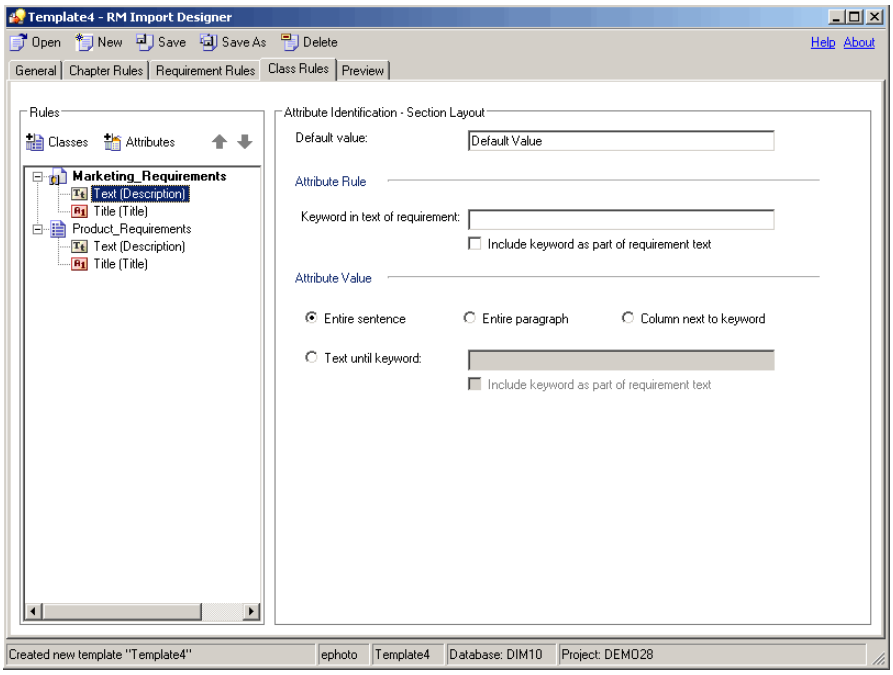

Figure 4-15. Class Rules Tab—Section or Keyword Option—Text or Numeric Attributes

To complete the Class Rules tab for text or numeric attributes with the Section or Keyword option:

1. In the **Default value** field, type a default value for the attribute value if the attribute value cannot be found in the document. For numeric attributes, you must enter a number. This field must be filled in for mandatory attributes.

   For example, for the **Owner** attribute, you could set the default value to the name of the team lead for the project.

2. In the **Keyword in text of requirement** field, type the keyword, keywords, or Word regular expression to identify the attribute. If you want to include the keyword as part of the requirement, select the **Include keyword** check box.

> **NOTE** To perform a customized search, use a regular expression. For information about regular expressions, see "Word Regular Expressions" on page 191.

3. Under **Attribute Value**, specify one of the options described in the following table:

Option	Description
Entire sentence	The entire sentence in which the keyword is found is the attribute value.
Entire paragraph	The entire paragraph in which the keyword is found is the attribute value.

Option	Description
Column next to keyword	The requirement includes a table, and the entire content of the cell to the right of the first cell containing the keyword is the attribute value. When the cell that contains the keyword is the last cell in a row, the content of the first cell in the next row is the attribute value. **NOTE:** This does not pertain to the Table option.
Text until keyword	The text up to the specified keyword is the attribute value. Select the **Include keyword** check box if you want to include the keyword in the attribute value. The default is to exclude the keyword.

NOTE If you do not choose an **Attribute Value** option, the attribute value is the text following the keyword until the next keyword is found or the end of the chapter or document is reached.

Text or Numeric Attributes with Table Option

The following illustration shows the **Class Rules** tab for text or numeric attributes with the Table option:

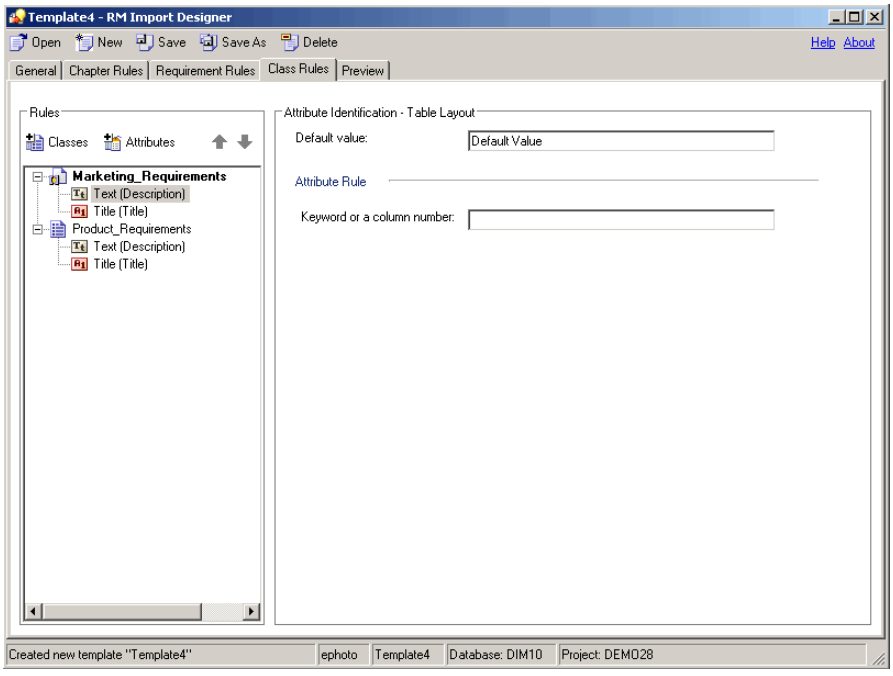

Figure 4-16. Class Rules Tab—Table Layout—Text or Numeric Attributes

To complete the Class Rules tab for text or numeric attributes with the Table option:

1 In the **Default value** field, type a default value for the attribute value if the attribute value cannot be found in the document. For numeric attributes, you must enter a number. This field must be filled in for mandatory attributes.

   For example, for the **Priority** attribute, you could set the default value to `Low`.

NOTE A red exclamation mark indicates that a mandatory default value must be specified. The title and description attributes always require default values, as well as attributes that are marked as mandatory in Class Definition.

2 In the **Keyword or a column number** field, type the keyword or column number to identify the attribute. For example, if the **Priority** attribute is in the third column, you could specify `3`. The information specified in the cell below the column heading represents the value of the attribute (for example, `High`).

NOTE To perform a customized search, use a regular expression. For information about regular expressions, see "Word Regular Expressions" on page 191.

List Attributes with Section or Keyword Option

The following illustration shows the **Class Rules** tab for list attributes with the Section or Keyword option:

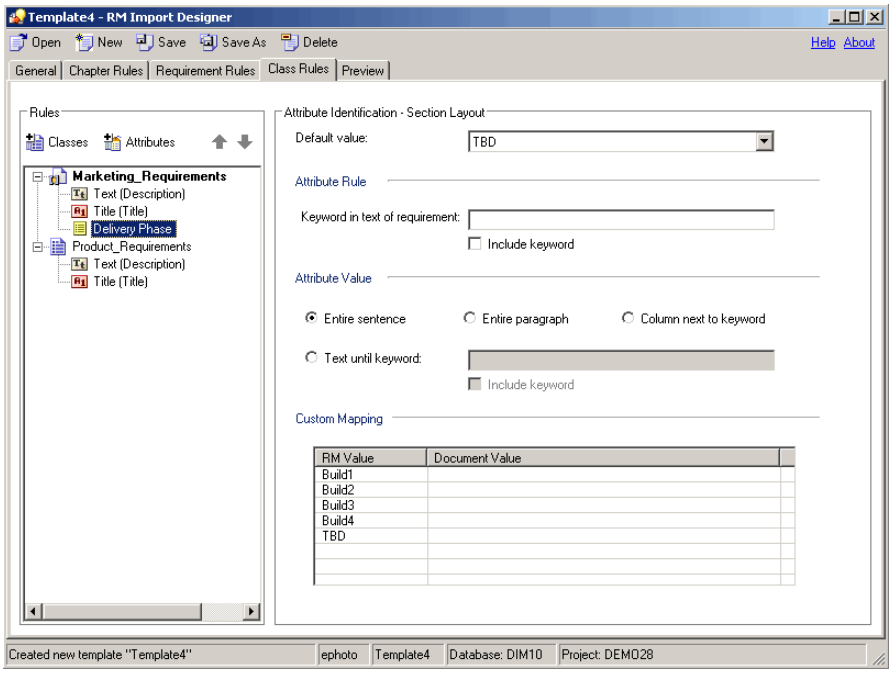

Figure 4-17. Class Tab—Section or Keyword Layout—List Attributes

To complete the Class tab for list attributes with a Section or Keyword layout:

1 In the **Default Value** field, select the default value for the attribute if the attribute value cannot be found in the document. For example, for a **Delivery Phase** attribute, you could select `TBD` (To Be Determined).

2 In the **Keyword in text of requirement** field, type the keyword, keywords, or Word regular expression to identify the attribute. If you want to include the keyword as part of the requirement, select the **Include keyword** check box. The **Keyword in text of requirement** field must be filled in for mandatory attributes.

NOTES

- A red exclamation mark indicates that a mandatory keyword must be specified.
- To perform a customized search, use a regular expression. For information about regular expressions, see "Word Regular Expressions" on page 191.

3 Under **Attribute Value**, specify one of the options described in the following table:

Option	Description
Entire sentence	The entire sentence in which the keyword is found is the attribute value.
Entire paragraph	The entire paragraph in which the keyword is found is the attribute value.
Column next to keyword	The requirement includes a table, and the entire content of the cell to the right of the first cell containing the keyword is the attribute value. When the cell that contains the keyword is the last cell in a row, the content of the first cell in the next row is the attribute value. **NOTE:** This does not pertain to the Table option.
Text until keyword	The text up to the specified keyword is the attribute value. Select the **Include keyword** check box if you want to include the keyword in the attribute value. The default is to exclude the keyword.

4 If you want to map values from the document to the actual values in the Dimensions RM database, under **Custom Mapping**, enter the values under **Document Value**. Separate multiple values with commas. If you map values, the Dimensions RM values appear in the imported document instead of the document values. For example, `Build 3` is the value in the Dimensions RM database, but `Alpha` is the corresponding value in the document.

List Attributes with Table Option

The following illustration shows the **Class Rules** tab for list attributes with the Table option:

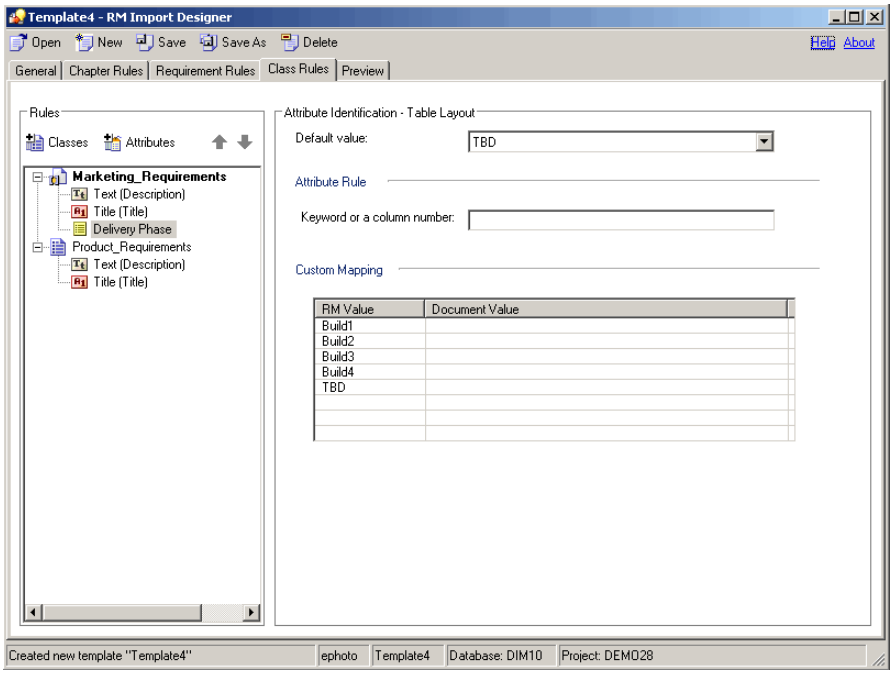

Figure 4-18. Class Rules Tab—Table Layout—List Attributes

To complete the Class Rules tab for list attributes with the Table option:

1. In the **Default value** field, select the default value for the attribute if the attribute value cannot be found in the document. For example, for a `Verification Status` attribute, you could select `Not Scheduled`.

2. In the **Keyword or a column number** field, type the keyword or column number to identify the attribute. For example, if the **Verification Status** attribute is in the third column, you could specify 3. The information specified in the cell below the column heading represents the value of the attribute (for example, `Passed`).

> **NOTE** To perform a customized search, use a regular expression. For information about regular expressions, see "Word Regular Expressions" on page 191.

3. If you want to map values from the document to the actual values in the Dimensions RM database, under **Custom Mapping**, enter the values under **Document Value**. Separate multiple values with commas. If you map values, the Dimensions RM values appear in the imported document instead of the document values. For example, `Scheduled` is the value in the Dimensions RM database, but `Committed` is the corresponding value in the document.

Preview Tab

The **Preview** tab allows you to see approximately how the document would look in Documents View if it were imported using the template you are working with. The preview appears in a tree-like structure in the left pane.

NOTE If the Word document is set to "Protected" mode with a read-only restriction, an error message could be displayed in the preview screen. To prevent this problem, copy all of the information from the protected Word document and paste it into a new Word document.

To preview the document:

1 Click the **Preview** tab.

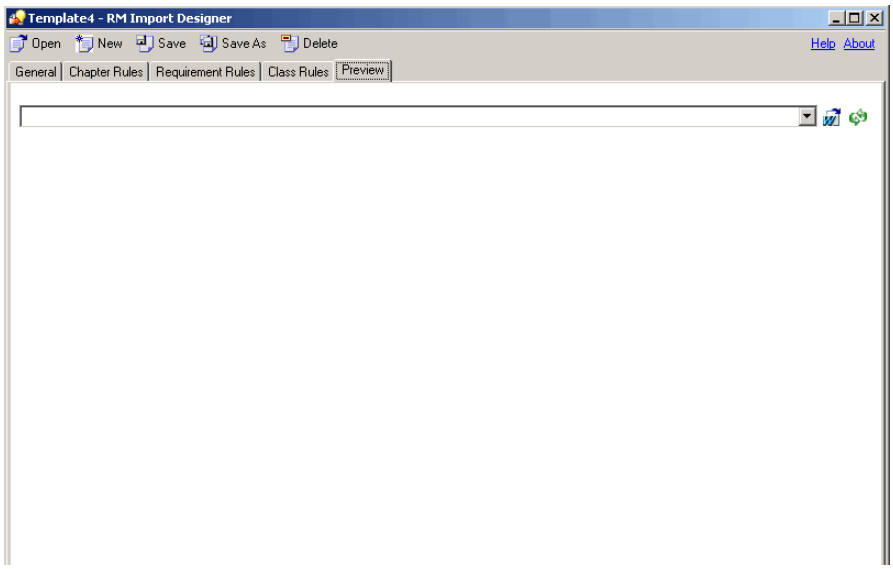

Figure 4-19. Empty Preview Tab

2 Do one of the following:

- Click the **Select a document to load** button . The **Open** dialog box opens. Select the document you want to preview and click **Open**.
- Click the **Load the currently selected document** button . Use this option if you made changes to the Word document and want to rerun the parser, or if you selected a previously viewed document in the dropdown list.

The **Parsing Word Document** dialog box shows you the progress of the document parsing. Click **Close** when the parsing is complete. The document structure is displayed in the left pane.

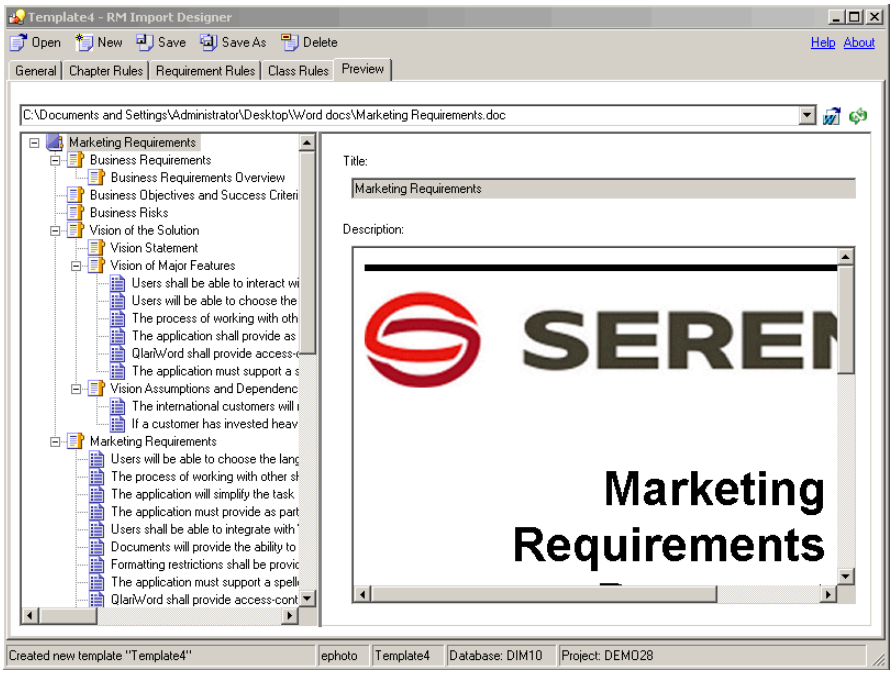

Figure 4-20. Preview Tab

Word Regular Expressions

A number of fields can contain keywords or regular expressions. The content of these fields can either be text that is to be matched (such as "shall") or a Word regular expression.

TIP Before you type a regular expression in a field in RM Import Designer, test it in Word on the document you are going to parse. To do so, open the Word document, Select **Edit** | **Find**, click **More**, select **Use Wildcards**, and then type the expression in the **Find What** field. You can also click **Special** to select wildcard characters that can be used to build regular expressions.

This section briefly describes how to use Word regular expressions, and provides some examples of their use.

NOTE For comprehensive information about using Word regular expressions, refer to Microsoft documentation.

Word provides a set of wildcard characters that you can use to build regular expressions.

- A **wildcard character** is a keyboard character that represents one or many characters.
- A **regular expression** is a combination of literal and wildcard characters that you use to find text patterns. For example, if you want to search for "manage" but not "management," type **<manage>** instead of **manage**.

The following table lists the wildcard characters that you can use in Word.

Text to Search	Wildcard Character	Examples
Single character	?	**a?t** finds "act" and "art." It also finds these characters within a word (for example, "action" and "artist").
String of characters	*	**p*d** finds "pad" and "passed." The asterisk returns all characters and spaces that are between the specified literal characters.
Beginning of word	<	**<(para)** finds all words that start with "para,", such as "parakeet" and "paragraph."
End of word	>	**(out)>** finds all words that end with "out," such as "about" and "without" but not "outstanding."
One or more specified characters	[ ]	**s[io]n** finds "sin" and "son," but not "skin," because "k" is not specified within the brackets.
Single character in a range of characters	[x-z]	**[b-s]ought** finds "bought," "fought," and "sought." The range must be in ascending order (for example, b-s is correct, but not s-b)
Single character except the characters in the range inside the brackets	[!x-z]	**h[!a-m]ck** finds "hock," but not "hack" or "hick."
Exactly *n* occurrences of the previous character or expression	{n}	**me{2}t** finds "meet" but not "met." **h[a-z]{2}d** finds "heed," "hand," and "hind," but does not find "hid" or "had". **h([a-z]){2}d** finds "heed" but not "hand" or "hind."
At least *n* occurrences of the previous character or expression	{n,}	**lo{1,}t** finds "loot" and "lot."
From *n* to *m* occurrences of the previous character or expression	{n,m}	**30{1,3}** finds "30," "300," and "3000."
One or more occurrences of the previous character or expression	@	**ro@t** finds "rot" and "root."
Any wildcard character	*wildcard_ character*	**[\?]** finds all question mark wildcards, **[*]** finds all asterisk wildcards, and so on.
To group characters and set orders of evaluation	( )	**h([a-z]){2}d** finds "heed" but not "hand," "hind" or "had."

NOTE Wildcard searches are case sensitive.

Example Word Regular Expressions

The following table contains example Word regular expressions that you could use in your templates.

Word Regular Expression	Description
RQMT_[0-9]@	Finds sequences that start with "RQMT_" and any number of numbers. For example, **RQMT_0009**.
\<\<SYS[0-9]@\>\>	Finds sequences that start with <<, then "SYS" and any number of numbers, and that end with >>. for example, **<<SYS0109>>**.
[0-9].	Finds sequences that start with any number and a period. For example, **24.**.
0[0-9]@	Finds sequences that start with 0 followed by any number of numbers. For example, **0008**.
[0-9].[0-9].[0-9]	Finds sequences that start with three numbers separated by decimal points. For example, **1.2.6**.

Limitations

This section describes some limitations of the RM Import tool. Be sure to take these limitations into consideration when you design templates.

IMPORTANT! Before you prepare a template that will be used to import a Word document, save the document as HTML and examine the results. This is the way the document will be displayed in RM Browser after it is imported. If you see any formatting problems that are unacceptable (for example, problems with lists, bullets, and fonts), adjust the styles used in the Word document until the results are satisfactory.

- Microsoft Word uses unique, proprietary styles and formatting; therefore, the styles and formatting of the Word document (for example, lists, bullets, and fonts) are not necessarily preserved in Document View. However, the text is always imported, so there is no data loss.
- You cannot import the changes you make in Document View back into the original Word document. Roundtripping between Dimensions RM and Word is not supported.
- Custom headings that you create based on standard Word headings are imported as standard Word headings, not as custom headings.
- On the **Requirement Rules** tab for the Keyword option:
  - If you select the **Include entire table as part of requirement text** check box, the keyword must be in the table to be included as part of the requirement. The entire table that contains the keyword is the requirement.
  - If you do *not* select the **Include entire table as part of requirement text** check box, and if the **Begin Pattern** keyword is found and the end of the chapter is reached, the table is included as part of the requirement.

  - If the keyword you typed under **Begin Pattern** is found and the end of the chapter is reached, the requirement is captured, even if the keyword you typed under **End Pattern** is not at the end of the chapter.

- Importing every cell in a table as a requirement is not supported.
- If a list number in the Word document is preceded by text (such as *Requirement#*), the text is not imported. Therefore, *Requirement #1* in the Word document is imported as *1.*
- If you use the **Entire sentence** option to capture attributes, lists in the Word document might not be imported.

Examples

Appendix A, "RM Import Designer Examples" on page 215 contains examples of Word documents and explains how their structure determines how you set up templates for them.

Chapter 5

Application Lifecycle Framework (ALF)

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Overview

This chapter describes how to emit Application Lifecycle Framework (ALF) events from Serena® Dimensions® RM and the Web services needed to implement an integration between Dimensions RM and another application, for example, Dimensions CM.

The following prerequisites must be met before you can implement integration:

- Serena® Mashup Composer—A visual interface for creating and designing mashups, which are Web applications that mix information from more than one source into a single application. Mashup Composer lets you manipulate applications and orchestration workflows to meet specific business needs.
- Web services—You must understand Web services and how they interoperate in custom ways.
- ALF—You must have a working knowledge of ALF. ALF defines an open source framework which, when adhered to, enables applications to interact using Web services, events, and BPEL process. Download the archived ALF project home page on www.eclipse.org/alf for more information.

Architecture

To be involved in an ALF-based integration, Dimensions RM must emit ALF events and send notifications to the ALF Event Manager, which starts ALF service flows that are defined in Mashup Composer. The service flows contain the rule that decides when and how to create items in each application.

The following flowchart illustrates the integration architecture.

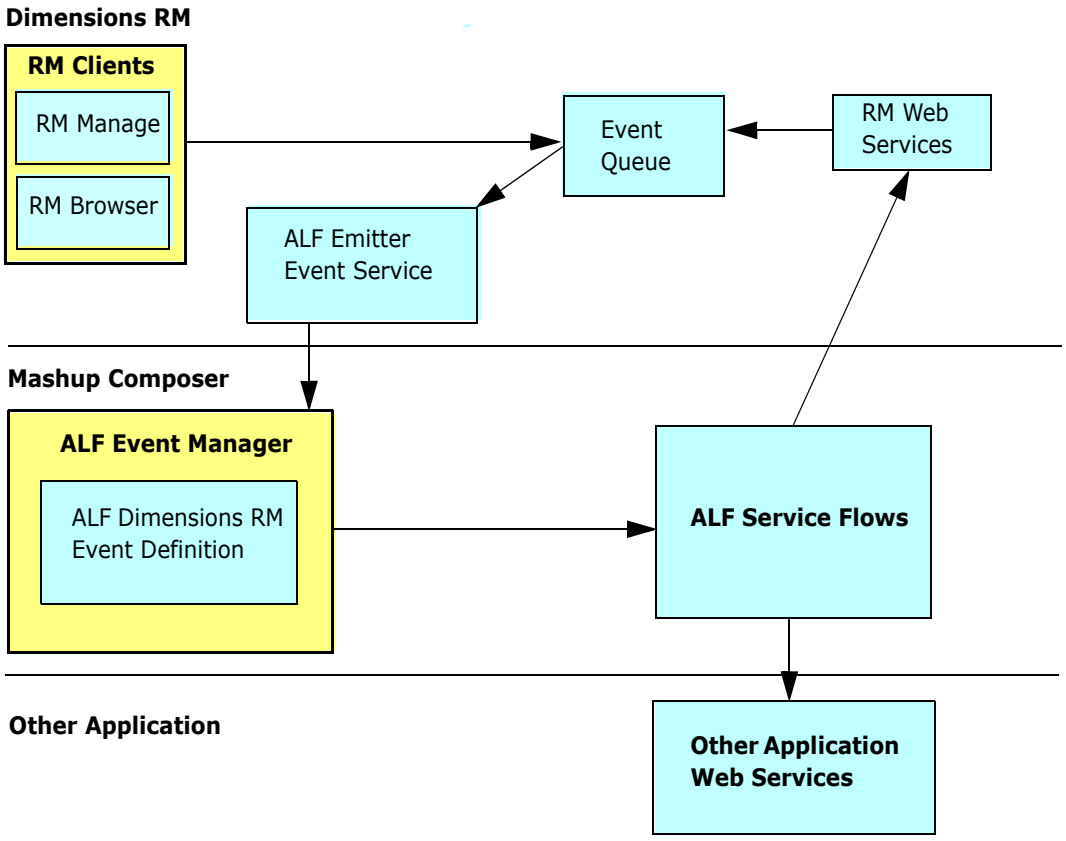

Figure 5-1. Integration Architecture

Emitting ALF Events

An *event* is a Web service message sent from Dimensions RM to the ALF infrastructure. The Event Manager defines an event Web service as the interface for ALF events, and Dimensions RM calls this Web service to emit events.

NOTE Before emitting an event, Dimensions RM determines whether the Dimensions RM project is an ALF-enabled project. The check box on the **Configure ALF Options** dialog box determines this. For more information about making a project an ALF-enabled project, see "Enabling a Project for ALF" on page 200.

The following flowchart illustrates the process of emitting an event from Dimensions RM.

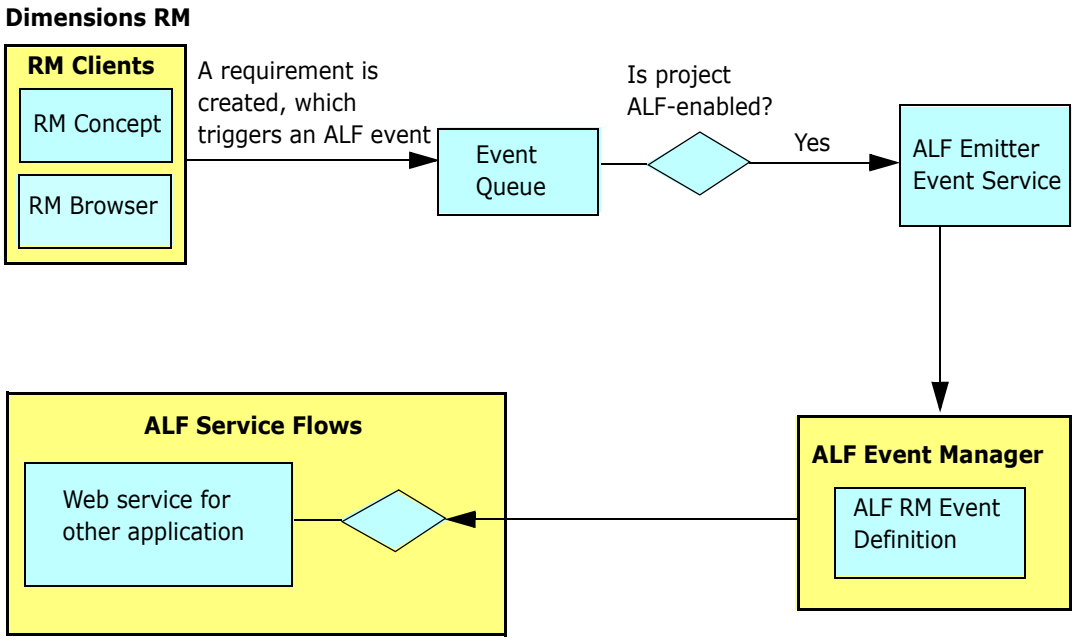

Figure 5-2. Emitting an Event from Dimensions RM

NOTE The decision block in the **ALF Service Flows** segment of the flowchart depends on the service flow design. For example, suppose you want to create an item in another application when a Dimensions RM requirement is moved to a collection named "Scoping." The decision block would determine whether the event type is "Add to Collection" and accordingly it should create the item in the other application.

Dimensions RM emits events on predefined trigger points, which are defined in the following section. Any condition check for the integration data synchronization is handled in the service flow.

Trigger Points

The following table describes the trigger points that cause Dimensions RM to emit ALF events.

Trigger Point	Object Type	Event Type
Requirement is created	Requirement	create
Requirement is updated or replaced	Requirement	update
Requirement is deleted or removed	Requirement	delete
Requirement is moved to a collection	Requirement	addToCollection
Requirement is removed from a collection	Requirement	removeFromCollection
Attachment is added to a requirement	Requirement	attachmentAdded
Attachment is removed from a requirement	Requirement	attachmentRemoved
Attachment is updated	Requirement	attachmentUpdated

Trigger Point	Object Type	Event Type
Requirement is linked	Link	create
Requirement is unlinked	Link	delete

Event Definition

The ALF event definition consists of the following:

- ALF Object Type—A string (for example, *Requirement*).
- ALF Event Type—A string (for example, *create*, *delete*, and so on).
- Custom extension data structure for a requirement or link. The custom extension data structure consists of database name, project name, requirement type, object ID, PUID, and user name. For the "addToCollection" and "removeFromCollection" events, the collection name is included in the extension data. For link events, the target requirement information is added to the extension data.

If there is a failure in the invocation of the event, error messages will be logged in the log file. For information about logging, see "Logging" on page 203.

Event Emitter

A standalone Microsoft® Windows service emits queued ALF events according to the interval specified in the `ALFEventConfig.xml` file. Events (for example, creating requirements) are not sent in real time, but according to these intervals.

The `ALFEventConfig.xml` file is stored in the `<RM Install Dir>\conf` directory.

Event Emitter Service

For information about starting and running the event emitter service, see "Configuring the ALF Emitter Service" on page 201.

Dimensions RM Web Services

Dimensions RM provides CRUD (create, read, update, delete) Web services that can be used for ALF service flows.

The following methods have been added to the existing Web services to support ALF.

Method	Description
`AddSyncXrefLink`	Creates a reference entry in the `SYNC_XREF` table, which can be used to store association information between Dimensions RM and the other tool.
`CreateObject`	Creates a requirement in the specified class.
`DeleteAttachment`	Deletes the specified requirement attachment.

Method	Description
`DeleteObjects`	Deletes the requirement. This is a soft delete, which deletes the requirement from the project but not from the database.
`DeleteSyncXrefLink`	Removes the reference entry between Dimensions RM and the other tool.
`GetObjectsInCollection`	Gets objects in specific collections.
`LinkObjects`	Creates a link between two requirements.
`ListCollections`	Gets a list of collections in the project.
`ListObjectLinks`	Lists all of the links for a requirement.
`ReadObject`	Returns information about a requirement.
`ReadObjectAttachment`	Returns information about requirement attachments.
`ReadObjects`	Returns information about requirements by reading multiple requirement identities (ids) at once. This is similar to ReadObject, but improves performance as multiple Requirements can be read by their ids in one call. Parameters: -sessionid — The current session identifier. -requirements — A list combination of PUID/Classname or objectID/Classname that specifies project requirements.
`ReadSyncXRefLink`	Gets the reference item information.
`UnLinkObjects`	Removes the link between two requirements.
`UpdateObject`	Updates a requirement.
`UpdateObjectAttachment`	Updates requirement attachments.

For the full syntax and the parameters for these methods, see the Web services HTML reference information downloadable as a zip file from the Serena Support Web site.

Enabling a Project for ALF

If a project is an ALF-enabled project, ALF events are emitted. Otherwise, ALF events are not emitted.

To enable a project to emit ALF events:

1. Start RM Manage.
2. Expand the database and select a project.

3 Select **File** | **Configure ALF Options**. The **Configure ALF Options** dialog box opens.

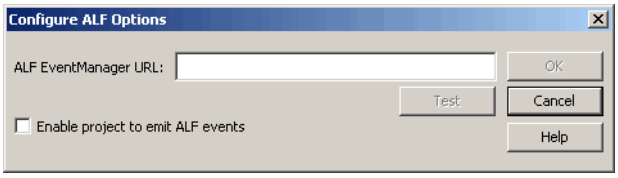

Figure 5-3. Configure ALF Options

4 In the **ALF Event Manager URL** field, type the URL of the Event Manager server.

5 Click **Test** to validate the Event Manager URL. If the test fails, a message is displayed.

6 Select the **Enable project to emit ALF events** check box if you want to make the project an ALF-enabled project.

Configuring the ALF Emitter Service

The following sections describe how to configure the ALF emitter service.

Usage

The command-line usage for the emitter service is as follows:

```
ALFEventEmitter [-f file] [-c] [-e level] [-E file] [-L priority]
    [-k {install|config|uninstall|start|stop}] [-n name] [-v] [-h]
```

Options

The options shown in Usage are described in the following table.

Option	Description
`-c`	Validates the `AlfEventConfig.xml` file against the associated schema document. The schema document is specified at the top of the `AlfEventConfig.xml` file. By default, this file is `ALFEventEmitter.xsd` and is located in the `<RM Install Dir>\conf` directory. After validating the document and logging any errors, the emitter service quits without any further processing.
`-e level`	Shows startup errors of the following levels: debug, info, warn, error.
`-E file`	Logs startup errors to a file.
`-f file`	Specifies an alternative configuration file.
`-h`	Lists the available command-line options.
`-k install`	Installs an AlfEventEmitter service.
`-k config`	Changes the startup options of an AlfEmitter service.

Option	Description
`-k uninstall`	Uninstalls the emitter service.
`-k start`	Starts the emitter service.
`-k stop`	Stops the emitter service.
`-L priority`	Sets the Windows system priority for the emitter service. servicePriority must be LOW, BELOWNORMAL, NORMAL, ABOVENORMAL, HIGH, or REALTIME. If you do not specify this option, the emitter service runs under the default priority of BELOWNORMAL.
`-n name`	Sets the service name.
`-v`	Displays the version number.

Installation

To install the emitter service, user the `-k` install option. This creates an instance of the service with all the other parameters you specify.

To uninstall the emitter service, use the `-k uninstall` option. You must specify the same service name (`-n` *name*) that you used when you installed the service; otherwise, the service will not be uninstalled correctly.

Using SSL Authentication with ALF

If you have configured secure sockets layer (SSL) as your authentication method for Serena Business Manager (SBM) and you are using ALF to integrate with SBM (formerly called Serena Business Mashups), you must complete the steps in this section. These steps are required in order to use Dimensions RM and ALF with SBM with SSL security enabled.

To use SSL authentication with ALF:

1 Open the following file in a text or XML editor:

RM_HOME\conf\ALFEventConfig.xml

2 Make sure that section such as the following is present and set correctly:

```
<SslAuthentications>
<SslAuthentication authenticationtype="SOAP_SSL_DEFAULT"
cafilename="server.cer"
cafilepath=""
keyfile="client.pem"
keyfilepassword="password" />
</SslAuthentications>
```

3 Set the attributes as follows:

- `authenticationtype`

  Set to any of the following:

  - `SOAP_SSL_DEFAULT` - Default Authentication mode

- `SOAP_SSL_NO_AUTHENTICATION` - Disable server authentication
- `SOAP_SSL_REQUIRE_SERVER_AUTHENTICATION` - If the client requires the server to authenticate
- `SOAP_SSL_REQUIRE_CLIENT_AUTHENTICATION` - If the server requires the client to authenticate
- `SOAP_SSL_SKIP_HOST_CHECK` - If the client does not check the common name of the host in certificate
- `SOAP_SSL_RSA` - Use RSA
- `SOAP_SSLv3_TLSv1` - Use SSL v3 and TLS v1 support by default
- `SOAP_TLSv1` - Use TLS v1 only

To have more than one authentication type, use a pipe to separate the types (|). For example: `SOAP_SSL_DEFAULT | SOAP_SSL_SKIP_HOST_CHECK`

If "authenticationtype" is blank then the emitter service will interpret the setting as `SOAP_SSL_NO_AUTHENTICATION`

For details on authentication types, refer to the gSOAP guide:

http://www.cs.fsu.edu/~engelen/soapdoc2.html

- **`cafilename`**

  Trusted certificate file name (this is needed to verify the server).

- **`cafilepath`**

  Path to the directory with the trusted certificates.

- **`keyfile`**

  Required only when the client must authenticate to the server.

- **`keyfilepassword`**

  Password to read the key file.

4 Save the file.

Logging

The emitter service provides log files that contain information about its current state. Furthermore, the `AlfEventConfig.xml` file can return to the emitter service information that needs to be written to the log file.

NOTE The file named `ALFEvents.log` contains startup information. The startup information describes what happens during the parsing of the `AlfEventConfig.xml` file and other activities by the emitter service before starting an event cycle.

This file contains information about the event cycles themselves. This is the file that you will check the most often.

Logging Configuration File

The logging configuration file (`<RM Install Dir>\conf\log4cpp.conf` by default) controls some of the behavior of the integration between Dimensions RM and another application:

- Level of detail (DEBUG, INFO, WARN, ERROR)
- Location of the log file
- Name of the log file
- Maximum size of the log file

The maximum number of log files that are maintained as a result of "rolling" to additional files after a log file reaches the maximum size limit

The `log4cpp.conf` file contains five categories:

- `fileBrowser`
- `fileSyncEngine`
- `fileWebService`
- `fileDbDoctor`
- `fileAlfEventEmitter`

You can change the level of detail by replacing the default value (WARN) with one of the other values. DEBUG output includes all step-by-step information about the processing of events. INFO output includes ERROR output plus WARN output plus any state information. ERROR output includes only conditions that result in one or more actions not being performed (such as server failure). WARN output includes ERROR output plus problems with the database or XML file configuration, undefined fields, or value truncation.

You can change the location of the log file by updating the `log4cpp.conf` file. You can also change the name of the log file.

To control the size of the log file, see "Controlling Log File Size," below.

The layout of the output of the log file is controlled by the `log4j.appender.fileALFEventEmitter.layout` settings, which use standard log4j formatting.

CAUTION! You should not change anything else in the `log4cpp.conf` file.

Controlling Log File Size

There are two possible settings for log4jappenderfile<category>, which controls how information gets appended to the log. The simplest configuration lets the log file grow indefinitely:

```
log4j.appender.fileALFEventEmitter=org.apache.log4j.FileAppender
```

However, it is more likely that you want to limit the maximum size of the log file so that it does not consume excessive system resources. To do this, specify a "rolling file appender", which starts a new file (such as `ALFEvents.log2`) after the first file exceeds

the specified size limit. In the following example, the maximum file size is 5,000,000 bytes, and no more than three (the most recent three) log files are retained.

```
log4j.appender.fileALFEventEmitter=org.apache.log4j.
    RollingFileAppender
log4j.appender.fileALFEventEmitter.maxFileSize=5000000
log4j.appender.fileALFEventEmitter.maxBackupIndex=3
```

Note that if you set `log4j.appender.fileALFEventEmitter.append` to `false` and you are using the rolling file appender, the emitter service starts a new log file each time that you start the service, regardless of whether the maximum file size was reached.

If you are not using the rolling file appender and you set `log4j.appender.fileALFEventEmitter.append` to `false`, the emitter service overwrites the log file each time the service starts.

Chapter 6

Web Service Logging

Starting Web Service Logging 208

Starting Web Service Logging

You can create a log file that helps you troubleshoot problems with Web services. RM Import and RM Import Designer use Web services.

To start a log file for Web services:

1. Create a `SERENA_LOGGER_CONFIG_CPP` system environment variable and set the value to `<RM Install Dir>\conf\log4cpp.conf`.
2. Reboot your machine.
3. Start RM Import or RM Import Designer.

   An `RMImport.log` file is generated in the `<RM Install Dir>\logs` directory, and reports errors that are generated, if any.

   The logging levels that can be reported in the `RMImport.log` file are shown in the following table:

Logging Level	Description	Logging Levels Included in Log File
Error	Shows operations that failed. Error is the most restrictive level of logging.	Error
Warning	Provides notification that an operation completed, but there were potential problems with the operation.	Error, Warning
Info	Provides general information about an operation.	Error, Warning, Info
Debug	Helps trace a problem. Debug is the highest level of logging.	Error, Warning, Info, Debug

4. Set the logging level that you want to use.
5. Restart the Web server.

Chapter 7

Troubleshooting

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Resolving HTTP 413 Errors in RM Import 211

Resolving "Password May be Incorrect in Security File or Security File May Not be Found" Error 211

Improving Poor Performance 212

Resolving Authentication Error with Some Secure Servers

An HTTP 401 error can be displayed when users try to log in to RM Import or RM Import Designer if the users are running Mircosoft Internet Information Services (IIS), and if the directory security does not allow the Web service to attach.

To resolve this problem, make sure that the directory security for the `rtmservices` virtual directory is set to allow anonymous access using an account that has the following local security policies assigned to it (such as the IUSR_<host> account):

- Access the computer from the network
- Allow log on locally
- Log on as a batch job

To determine or assign local security settings:

1. From the Control Panel, select **Administrative Tools | Local Security Policy**. The **Local Security Settings** window opens.
2. In the left pane, expand **Local Policies**.
3. Click **User Rights Assignment**.
4. In the right pane, locate **Access this computer from the network**. The accounts that have this policy are listed in the **Security Setting** column.
5. If you want to add an account to the list, double-click the policy. The policy **Properties** dialog opens. Click **Add User or Group** and add the account.
6. Repeat Step 4 and Step 5 for the **Allow log on locally** and **Log on as batch job** policies.

To determine or change the account that is providing anonymous access:

1. Right-click My Computer and select **Manage**. The **Computer Management** window opens.
2. In the left pane, expand the following nodes:
   - **Services and Applications**.
   - **Internet Information Services (IIS) Manager**
   - **Web Sites**
   - **Default Web Site**
3. Right-click **rtmservices** and select **Properties**.
4. Click the **Directory Security** tab.
5. Click **Edit** in the **Authentication and access control** section.
6. If you want to change the Windows user account for anonymous access, click **Browse** and select the account.

Resolving HTTP 413 Errors in RM Import

If you are using Microsoft Internet Information Services (IIS) 6 and are enabling client certificates, an HTTP 413 error may be reported as a result of uploading large files when you click the **Import** button in RM Import. To prevent this, make sure that the `UploadReadAheadSize` metabase property in IIS is larger than the file content length. If you continue to receive this error, increase the `UploadReadAheadSize` metabase property until the HTTP 413 error is no longer reported.

For more information, please refer to Microsoft Internet Services (IIS) 6 documentation.

Resolving "Password May be Incorrect in Security File or Security File May Not be Found" Error

The database encryption feature is a security measure designed to address the fact that there was a static, hard-coded password for the ICADMIN and ICPROJECT Oracle accounts. Before this feature was implemented, this hard-coded password was called by the Dimensions RM tools. With database password encryption, a customer can change the password for these accounts at any time, keeping them fully secure. For more information about database password encryption, see "Database Password Encryption" on page 75.

There are situations in which you may receive the "Password May be Incorrect in Security File or Security File May Not be Found" error when logging in to a Dimensions RM tool. The following table describes such scenarios and provides ways you can correct the problem.

Case	Potential Problem	Troubleshooting Procedure
1	No Dimensions RM project exists on the server.	Make sure you have a Dimensions RM project on the server. You can test for this by selecting your database instance in RM Manage, right clicking, and selecting **Change User** from the context menu. If you get the same error message again instead of a prompt to log in, then there is probably no project in the database instance.
2	You know a Dimensions RM project exists. The security file could be in the wrong location.	In RM Explorer or RM Manage, select **Workspace | Options**. Click the **Security** tab and verify the location and name of the security file.
3	You know the security file is in the correct location. The database instance might need to be updated to match the current security settings.	In RM Manage, select the database instance, right-click, and select **Convert Database**. When the database validation tool starts, select your instance and click **Upgrade**. When it prompts whether you want to recreate the stored procedures, click **Yes**.

Case	Potential Problem	Troubleshooting Procedure

4	The ICADMIN or ICPROJECT account could be locked.	In SQL Plus, try to log in as ICADMIN by typing the following command:
		`sqlplus icadmin/<dummy password>@<database instance>`
		If Oracle returns a message that the account is locked, type the following commands to unlock it:
		`sqlplus icdba/icdba@<database instance>`
		`alter user icadmin account unlock;`
		`exit`
		Perform the same procedure to check and unlock ICPROJECTS.

5	The Dimensions RM or Oracle path could be wrong.	In RM Explorer or RM Manage, select **Workspace | Options**. Click the **Mandatory** tab, and confirm that the **RTM_HOME** and **ORACLE_HOME** values are correct.

Improving Poor Performance

Please consult Oracle documentation or your database administrator (DBA) for tuning changes that could improve performance. For example, you might change the CURSOR_SHARING parameter to "force" or change the STATISTICS_LEVEL parameter to "all."

Chapter 8

Working with Secure Environments

Configuring the IIS Server for the ALM Integration 214

Configuring the IIS Server for the ALM Integration

If you are in a highly secure Serena® Dimensions® CM plus Serena® Dimensions® RM environment that utilizes a Microsoft® IIS server, you should configure that ISS server for the ALM integration. Perform the procedures detailed in relevant chapter in the common *Dimensions CM-Dimensions RM ALM Integration Guide* on the server where you have IIS running.

IMPORTANT! The IUSR account needs access to the Dimensions CM installation directory. Normally, the Dimensions CM tool manager account is `dmsys`, unless you created your own account and named it something else. This procedure assumes that the tool manager account is `dmsys`.

Appendix A

RM Import Designer Examples

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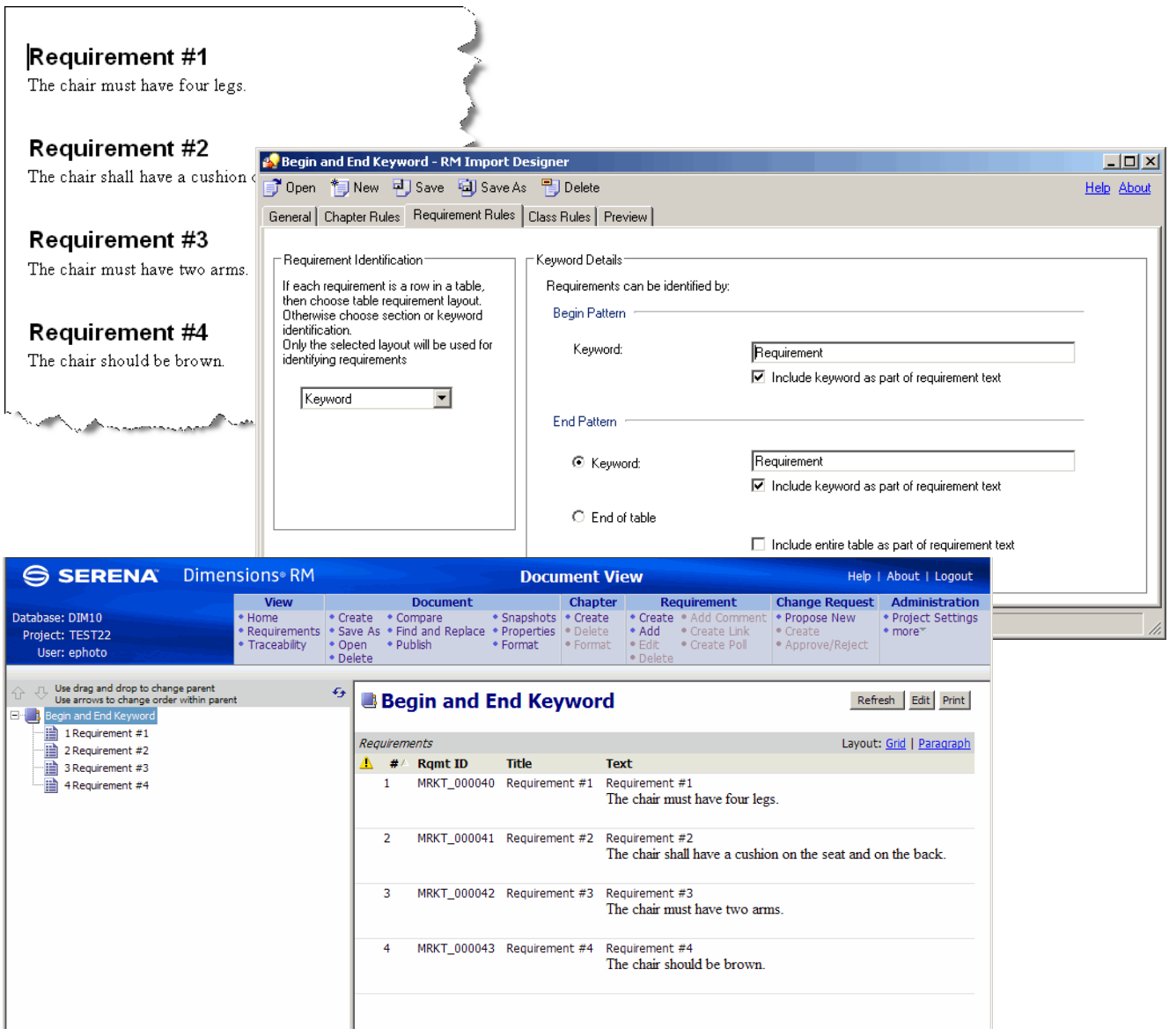
Overview

This appendix contains examples of Word documents and explains how their structure determines how you set up templates for them in RM Import Designer. It also contains illustrations of how the document looks in Document View in RM Browser after you import it using RM Import.

Begin and End Keyword

In this example, all four requirements are captured, because when the keyword you typed under **Begin Pattern** is found and the end of the chapter is reached, the requirement is captured, even if the keyword you typed under **End Pattern** is not at the end of the chapter.



Entire Table with a Keyword is the Requirement

In this example, the entire table is captured because the **End of table** option was selected in the **End Pattern** group, and the **Include entire table as part of requirement text** check box was selected.

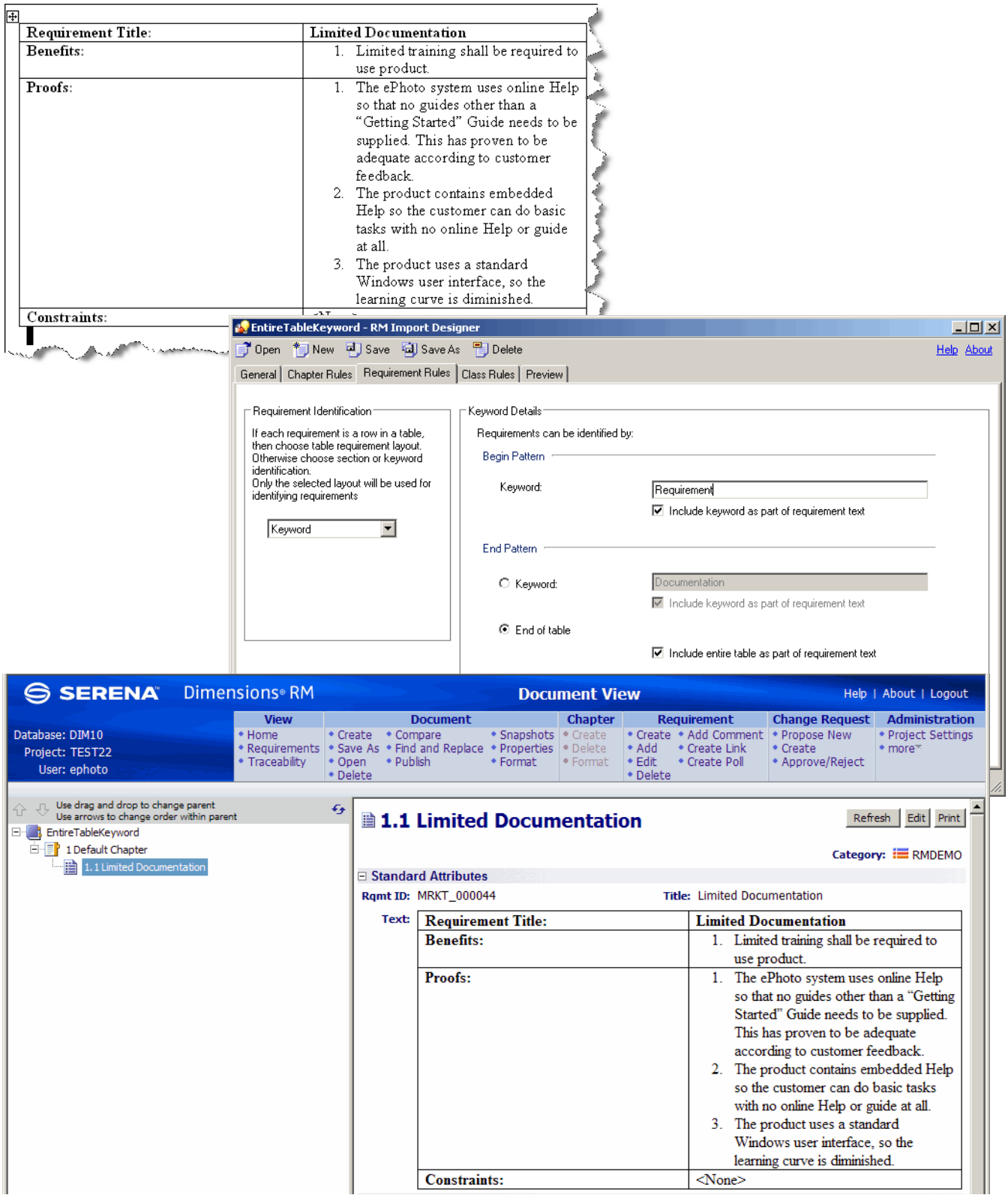
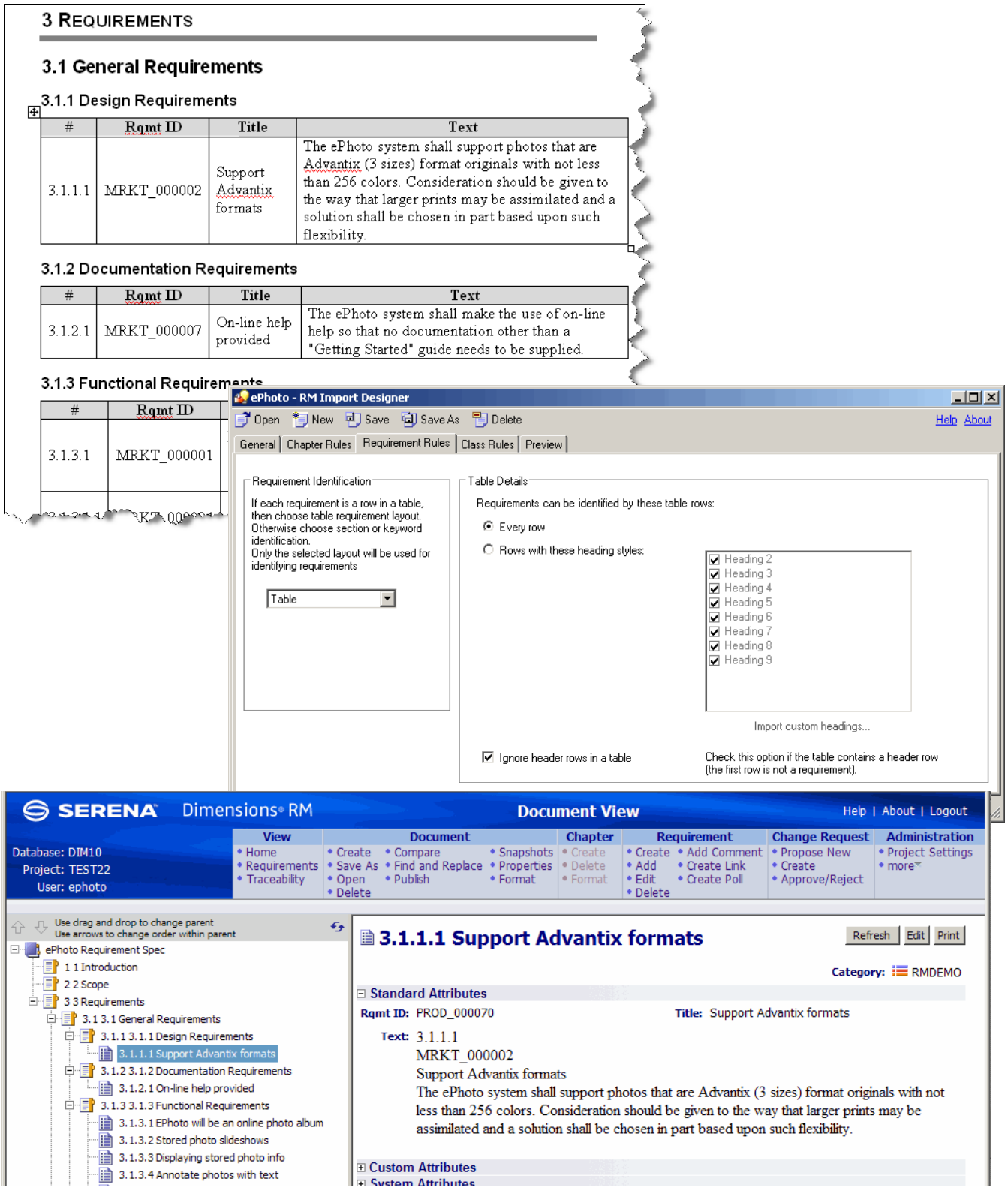


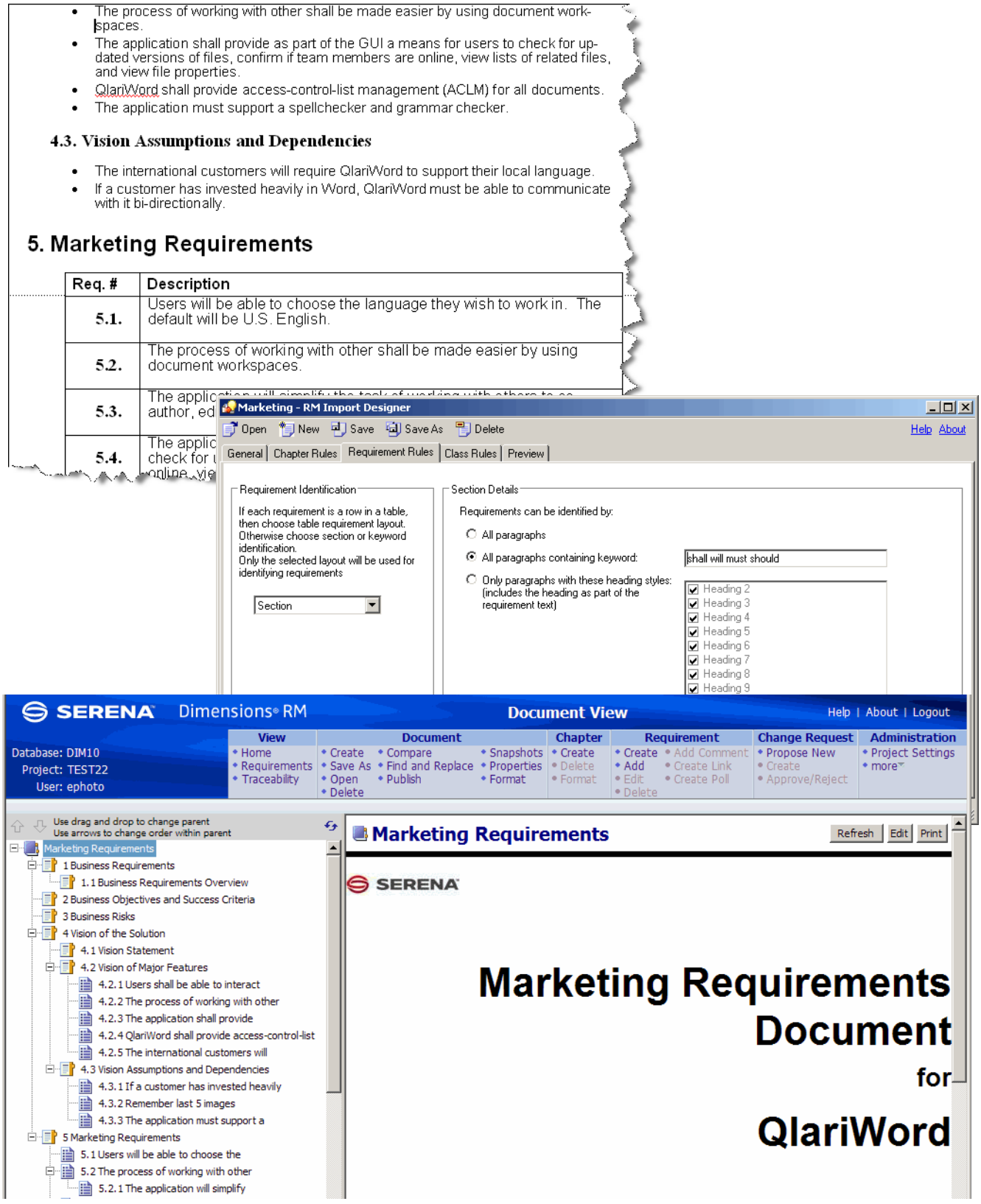
Table Option with Every Row

In this example, the title is captured because the title is in the third column of the tables, and on the **Class Rules** tab, for the **Title** attribute, **3** was typed in the **Keyword or a column number** box under **Attribute Rule**.



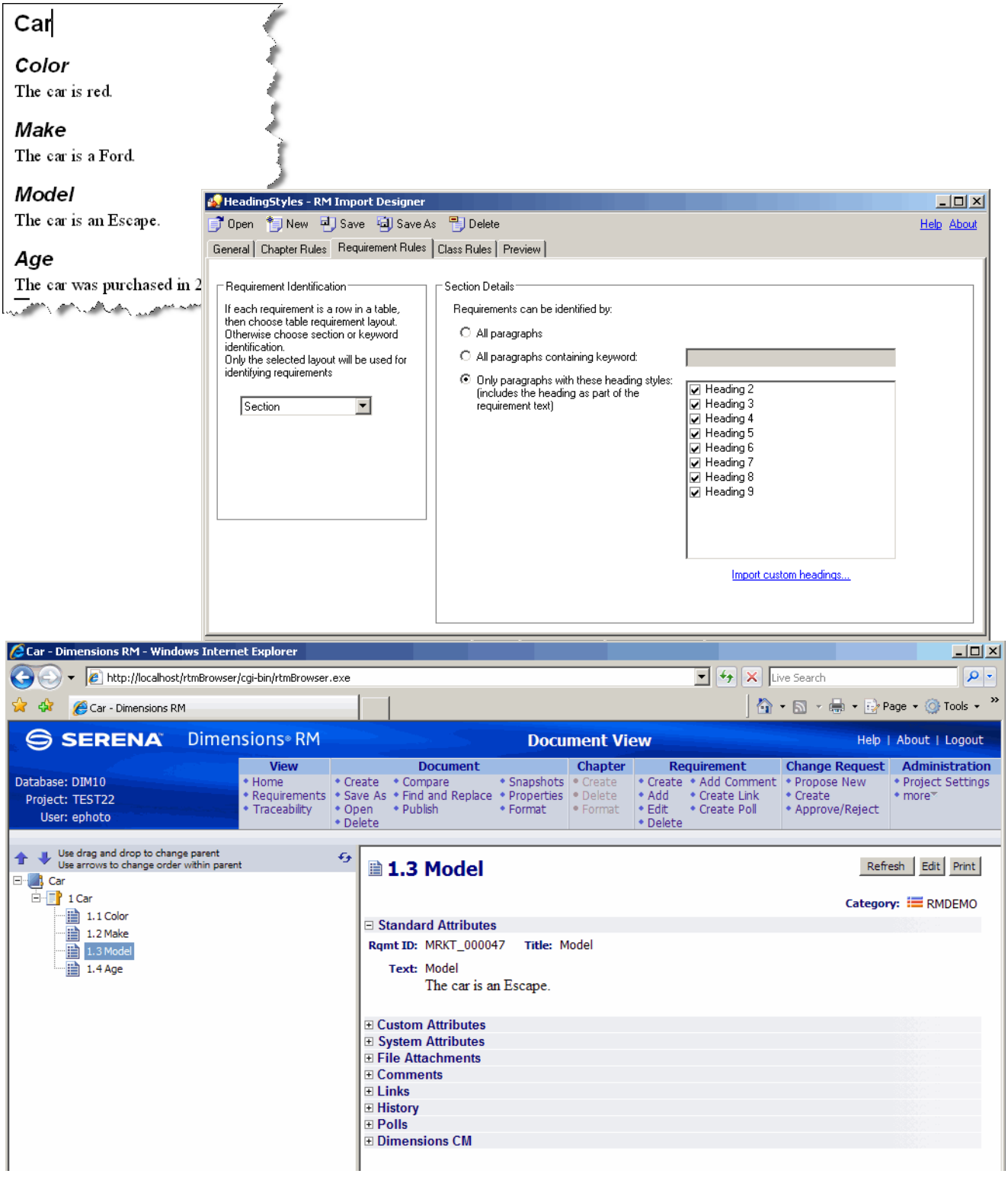
Section Option with Keywords

In this example, every paragraph containing the specified keywords is captured as a requirement.



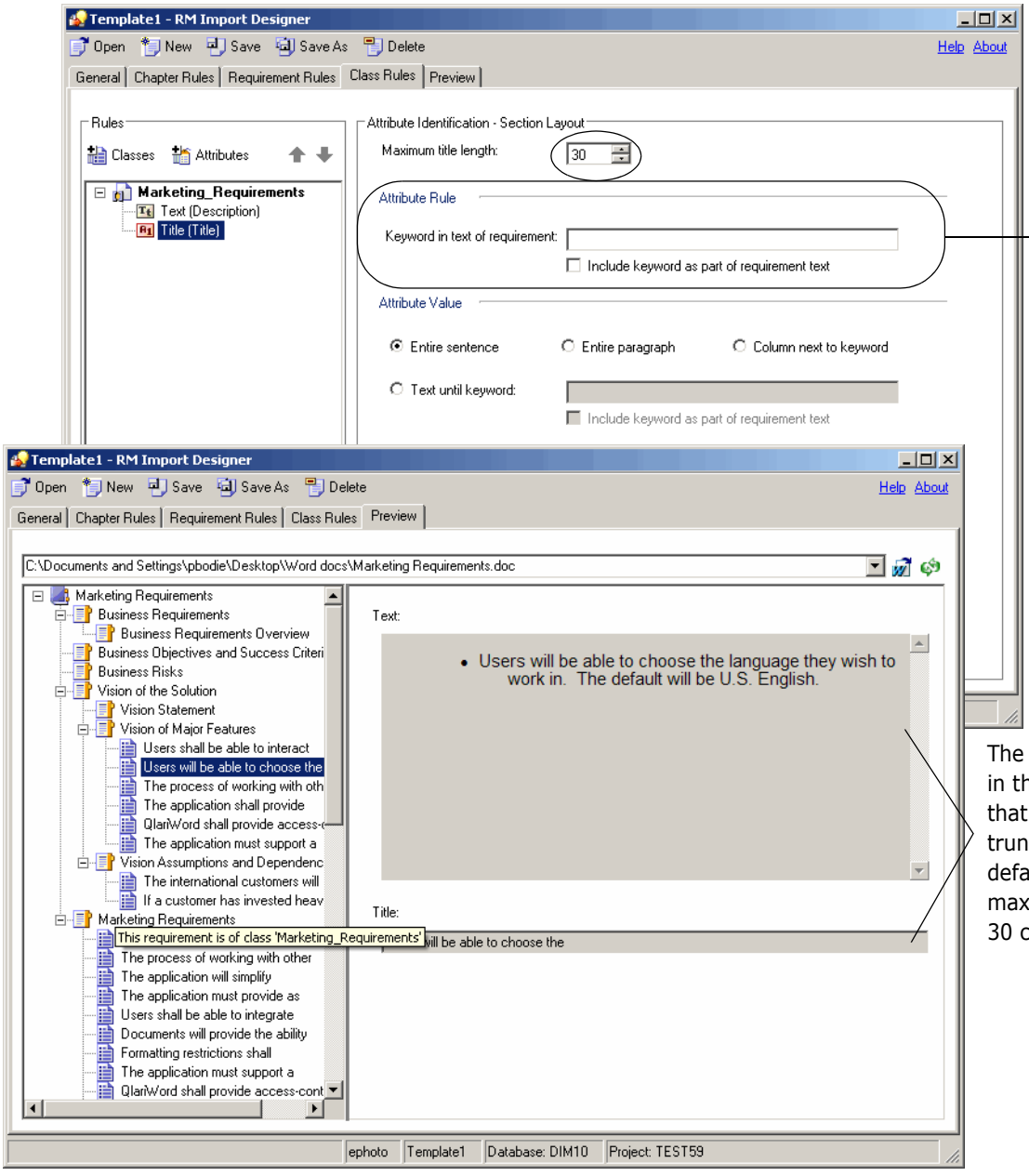
Heading Styles

In this example, the Section layout is used. Color, Make, Model, and Age have the Heading 2 style, while Car is a Heading 1 and therefore is not captured as a requirement.



Capturing Title and Description with No Title Rule

When you add a class to the Class Rules tab in RM Import Designer, the Title and Description attributes, along with the mandatory attribute, are added to the class rules. You can specify a rule for each of these attributes that indicates how the values should be identified and captured from the Word document. These rules are optional. For attributes other than Title and Description, if no rules are specified, default values are used. The following illustration shows the case where the **Attribute Rule** field is empty; thus there is no rule.



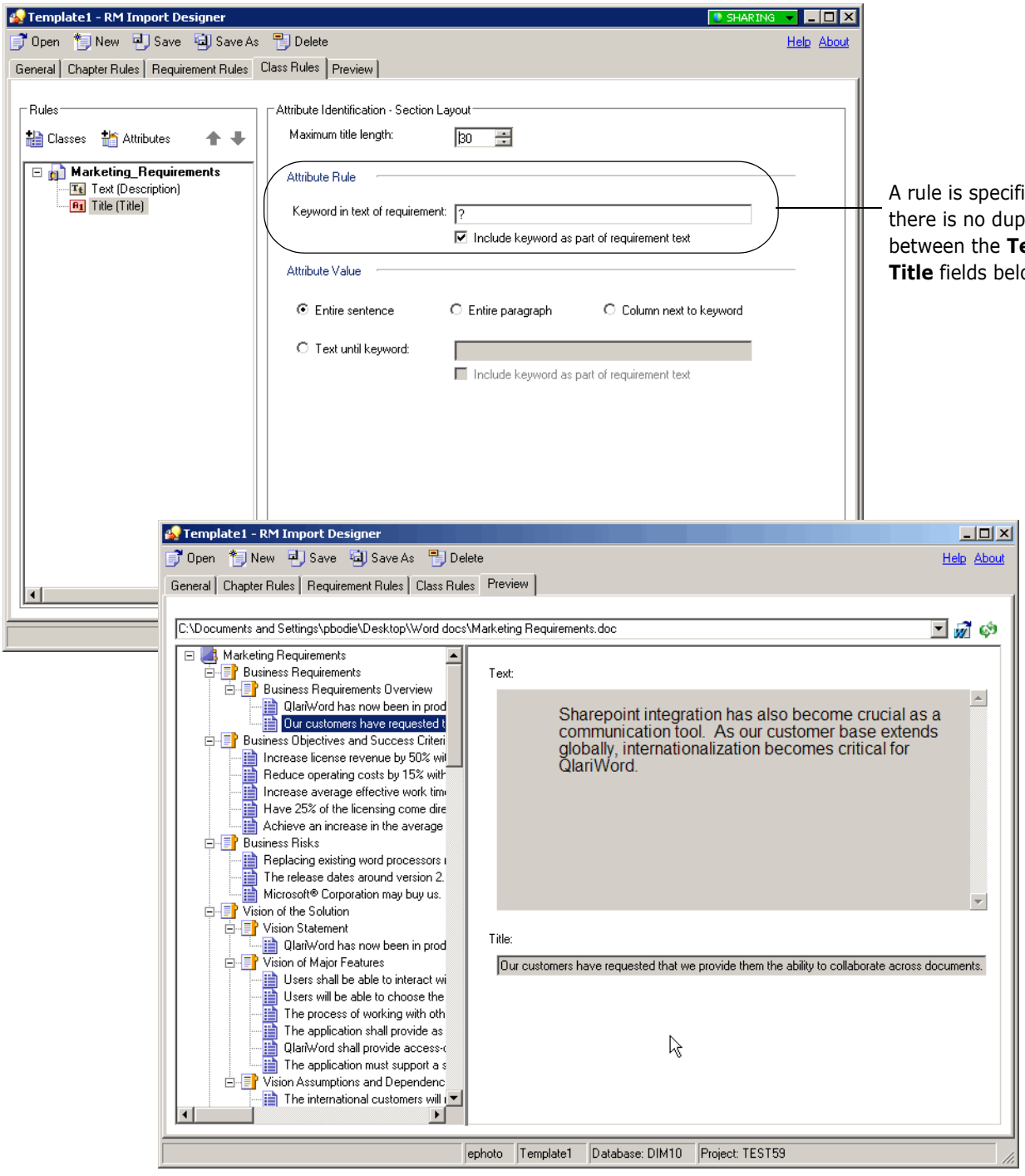
No rule is specified

The **Title** is duplicated in the **Text** field. Note that the **Title** is truncated due to the default rule that the maximum title length is 30 characters.

The next example shows what happens when you add a rule for the Title attribute.

Capturing Title and Description with Title Rule

In this example, a wildcard character is specified in the **Attribute Rule** field, and the **Include keyword as part of requirement text** check box is selected. Using the **?** wildcard character means that the first sentence with any character will be captured as a title. Because there is a rule, the title will not be duplicated in the description.



A rule is specified, so there is no duplication between the **Text** and **Title** fields below.

NOTE For more information about wildcards, see "Word Regular Expressions" on page 191 and Microsoft Word documentation.

Appendix B

RM Manage Icons and Toolbars

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RM Manage Icons

The following table describes the icons used in RM Manage.

Icon	Description
	Database
	Project
	Offline Project
	User
	Group
	Granted Access Rights
	Denied Access Rights
	Inherited Access Rights

RM Manage Toolbars

This section describes the RM Manage toolbars.

Main Toolbar

The following table describes the buttons on the main toolbar in RM Manage.

Button	Action
	View project information
	View group information
	View user information
	Show Help topics

Database Toolbar

The following table describes the buttons on the Database toolbar in RM Manage.

Button	Action
	New project
	Change user
	Change user password
	Configure login sources
	Convert database
	Administer tablespaces
	Show properties

Project Toolbar

The following table describes the buttons on the Project toolbar in RM Manage.

Button	Action
	Change project password
	Delete project account
	Define project schema
	Backup or restore project account
	Backup or restore project schema
	Place project account online
	Place project account offline
	Install project tables
	Drop project tables
	Recreate database procedures
	Recreate database indexes
	Recreate resources
	Administer email
	Administer locks
	Associate to Dimensions CM
	(Show) Properties
	Baseline link(s)

Group Folder Toolbar

The following table describes the button on the Group Folder toolbar in RM Manage.

Button	Action
	New group

Group Toolbar

The following table describes the button on the Group toolbar in RM Manage.

Button	Action
	Delete group

User Folder Toolbar

The following table describes the button on the User Folder toolbar in RM Manage.

Button	Action
	New user

User Toolbar

The following table describes the button on the User toolbar in RM Manage.

Button	Action
	Delete user

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