magicdraw™

Architecture Made Simple

TUTORIALS

version 17.0.1

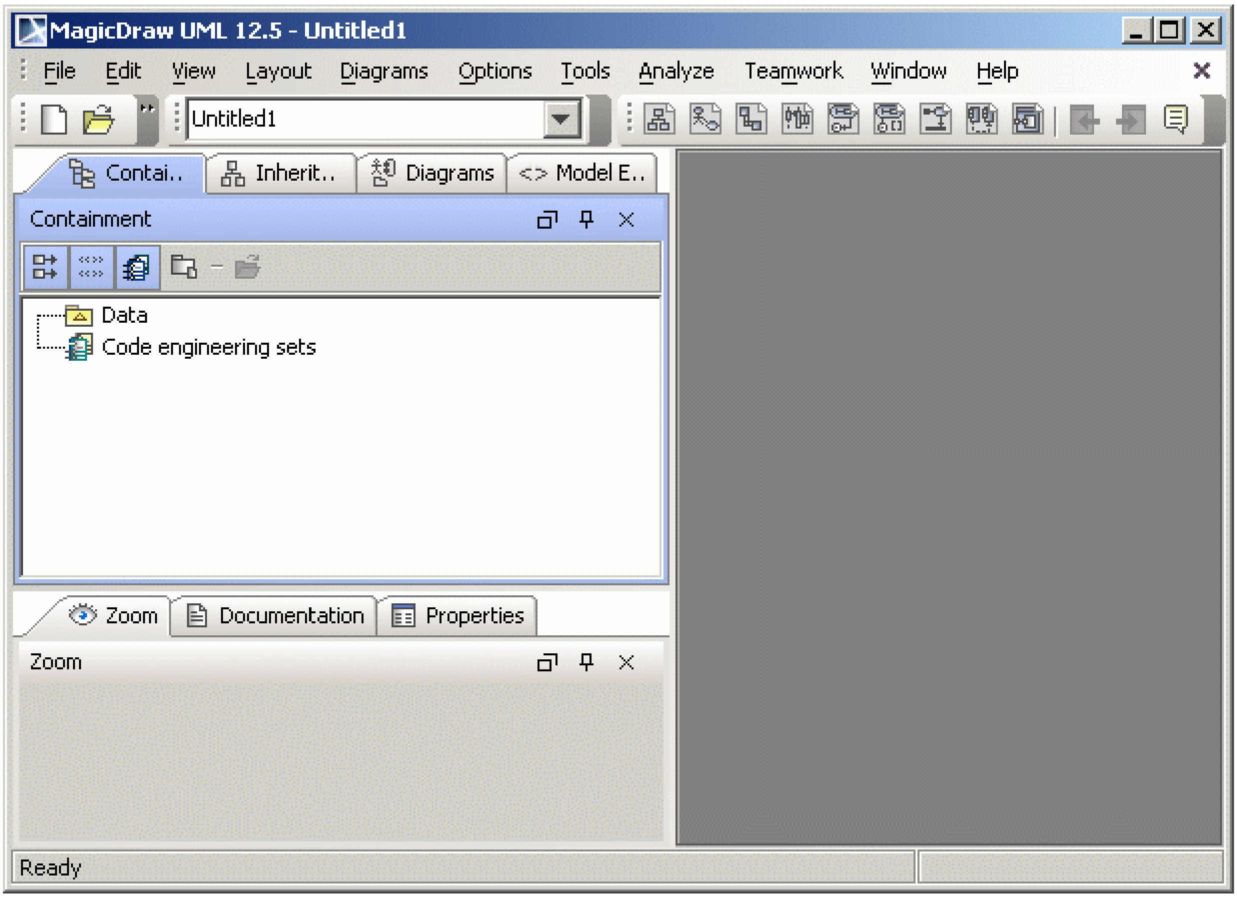
No Magic, Inc.
2011

CONTENTS

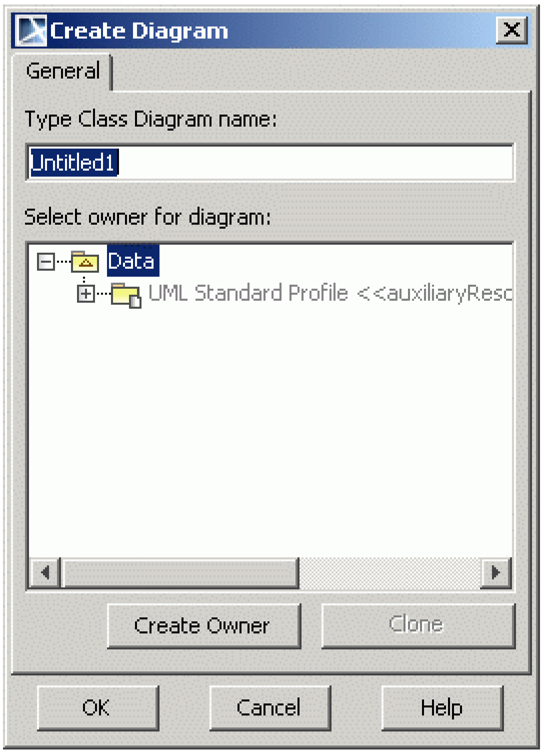
MAGICDRAW BASICS

STEP #1 Create a class diagram

1. Create a new project in MagicDraw. From the **File** menu, choose **New Project** and then select the **Blank Project** icon. Name the project or leave it untitled by default and click **OK**.



2. In the diagrams toolbar, click on the **Class Diagram** button . The **Create Diagram** dialog box appears.



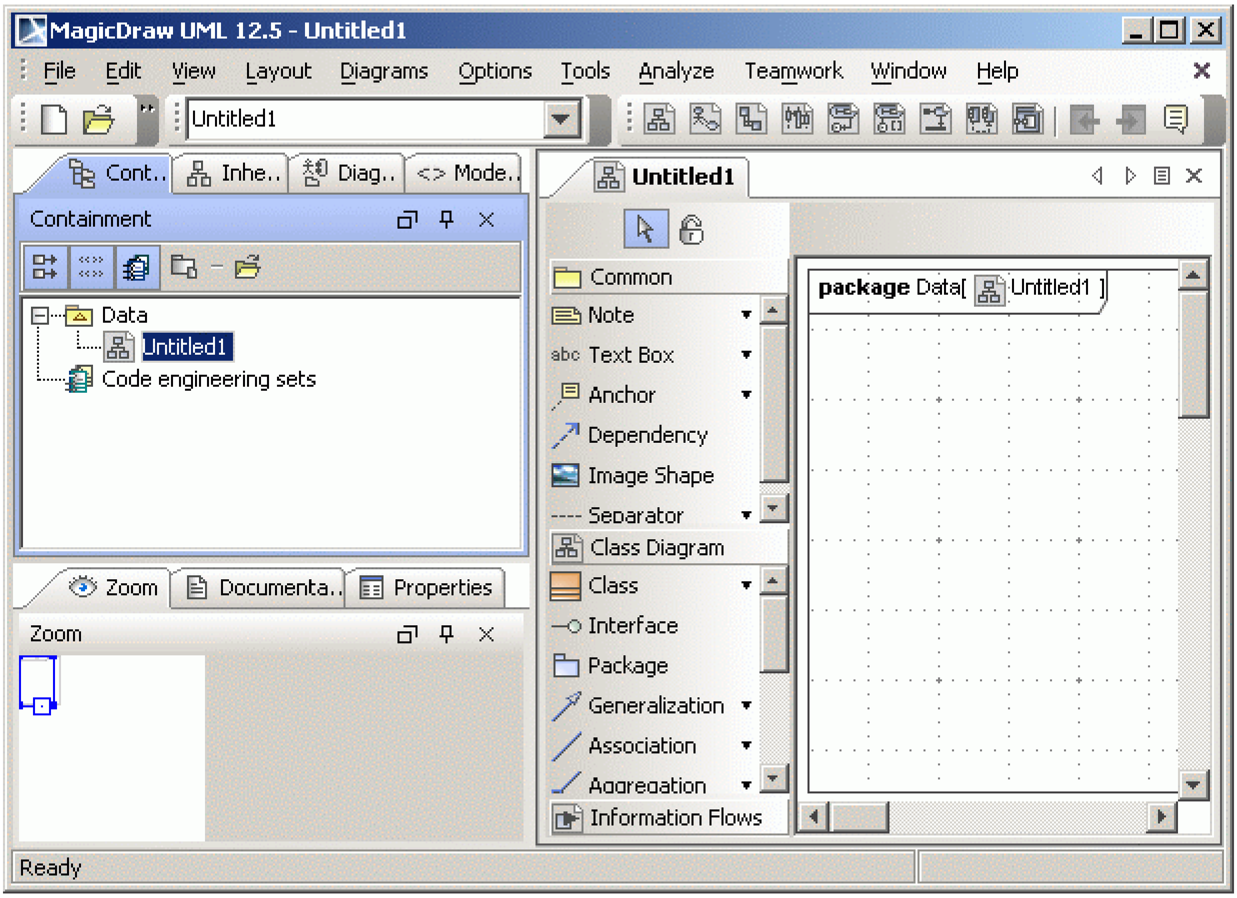
Type Class Diagram name: Untitled1

Select owner for diagram:

- Data
  - UML Standard Profile <<auxiliaryResc

3. In the **Type Class Diagram Name** field, enter the name of the new class diagram or leave the default name.
4. From the package tree, select the package where to contain the diagram (default is **Data**) or create the new one by clicking the **Create Owner** button and choosing **Package** from the list.

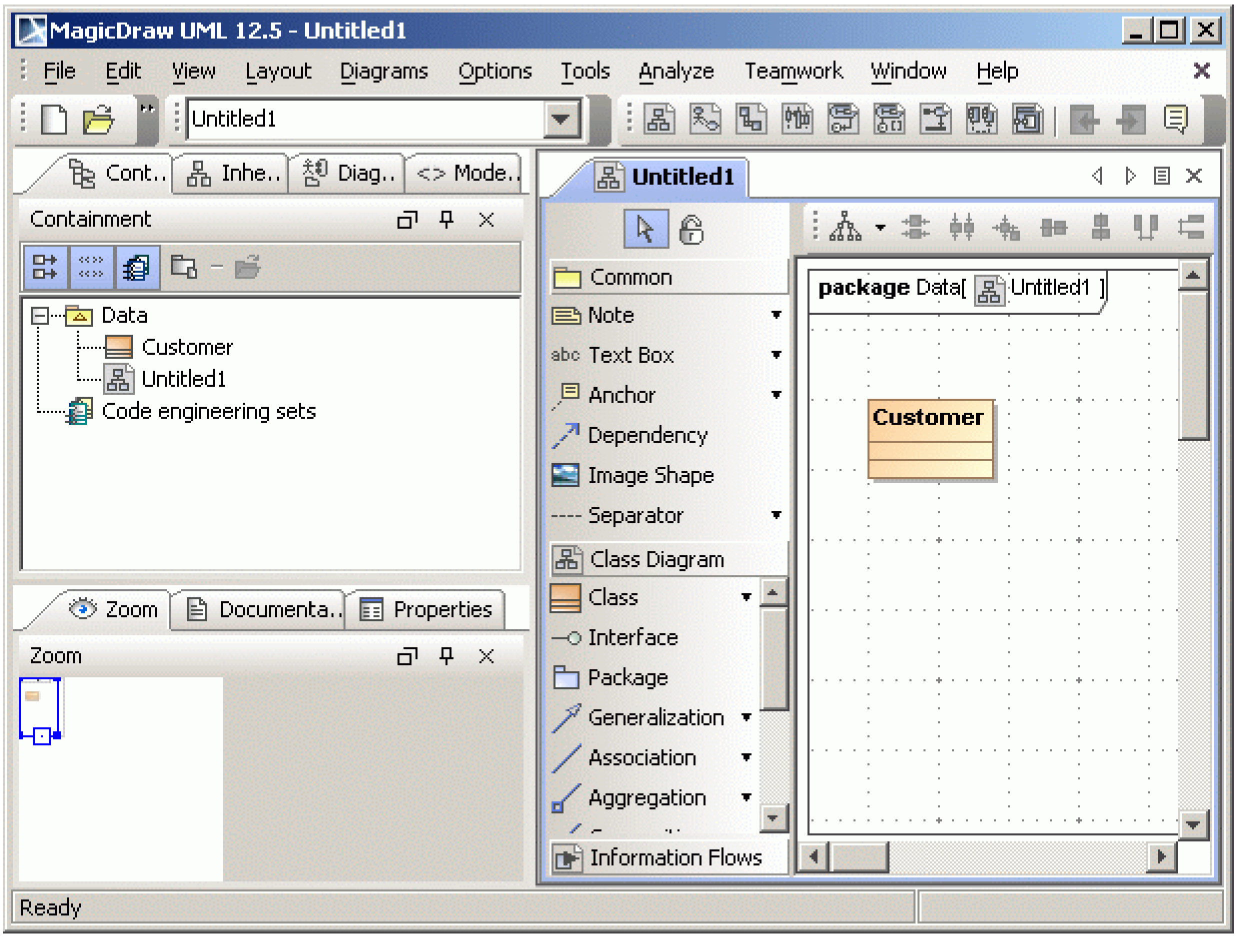
5. Click **OK**. The diagram is created and the diagram pane appears.



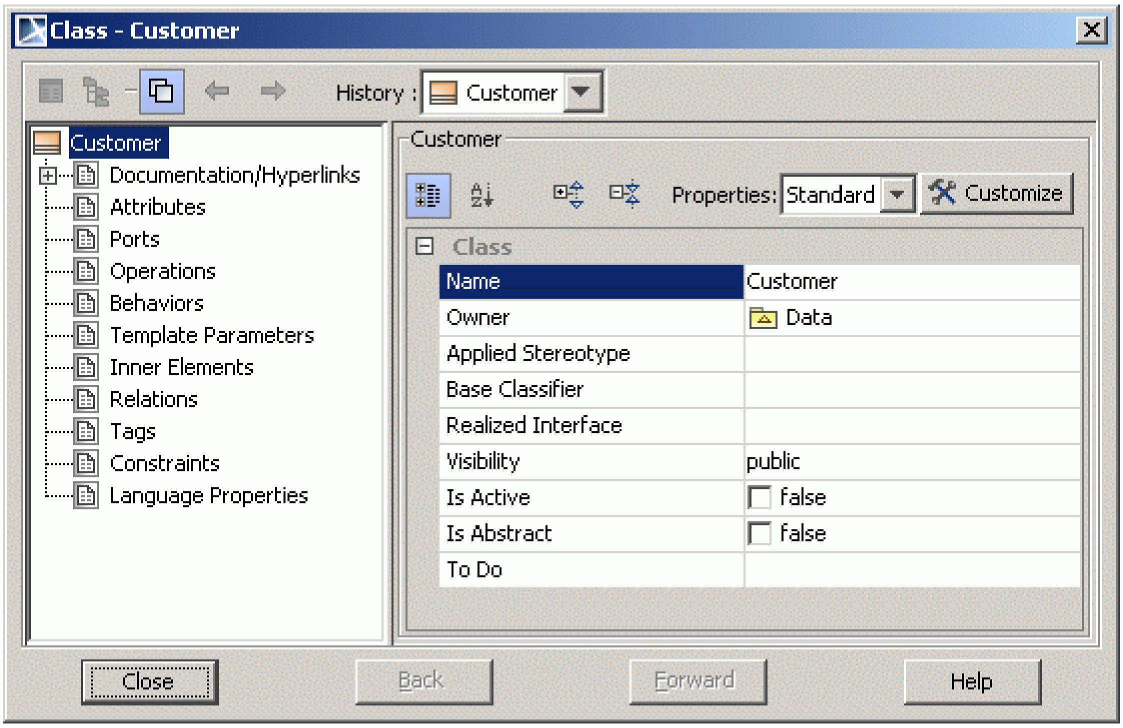
STEP #2 Create a new class element in diagram

1. In the diagram toolbar, click the **Class** button ▤. Click again on the diagram pane in order to place the class. Type the name for a class. Click anywhere on the diagram pane to close the class title line.

2. The class that you see on the diagram pane is only the class symbol. All the class data are contained in the Browser. You can see that the class *Customer* has been created in the browser when you have drawn it on the diagram pane.



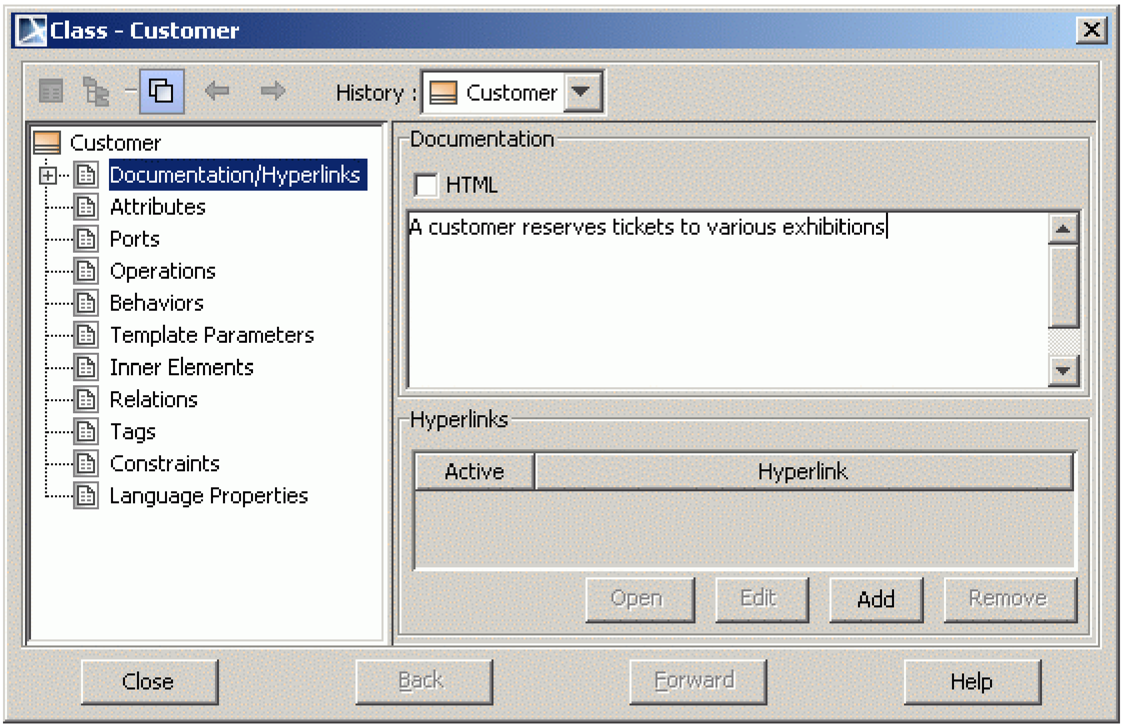
3. Double click on a class. The **Class Specification** dialog box appears. It contains various features of a class. For more detailed information about this dialog box, see MagicDraw Help.



Class

Name	Customer
Owner	Data
Applied Stereotype	
Base Classifier	
Realized Interface	
Visibility	public
Is Active	□ false
Is Abstract	□ false
To Do	

4. Select the **Documentation/Hyperlinks** group, add some documentation about this class. Click **Close**.



□ HTML

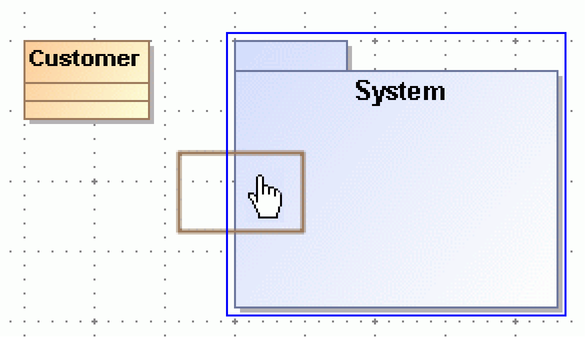
A customer reserves tickets to various exhibitions

STEP #3 Create package element in diagram

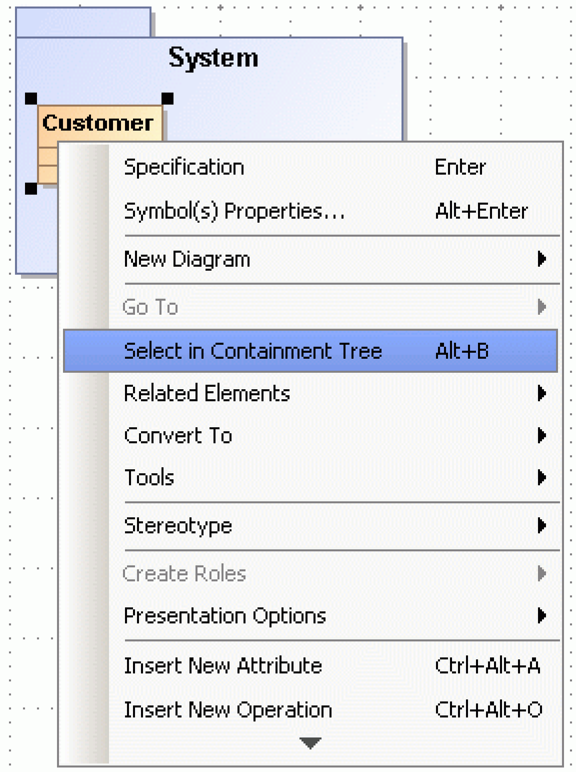
1. On the diagram tool bar, click the **Package** button .

1. Place the package on the diagram pane and name it *System*. Drag any corner of a package in order to reach its desired size.

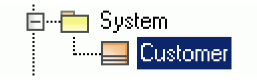
2. Move a class into the package. A blue border around the package appears when the class is dragged into it and it shows that the class is included into package.



3. Right-click on a class to access its shortcut menu. Choose the **Select in Containment Tree** command.

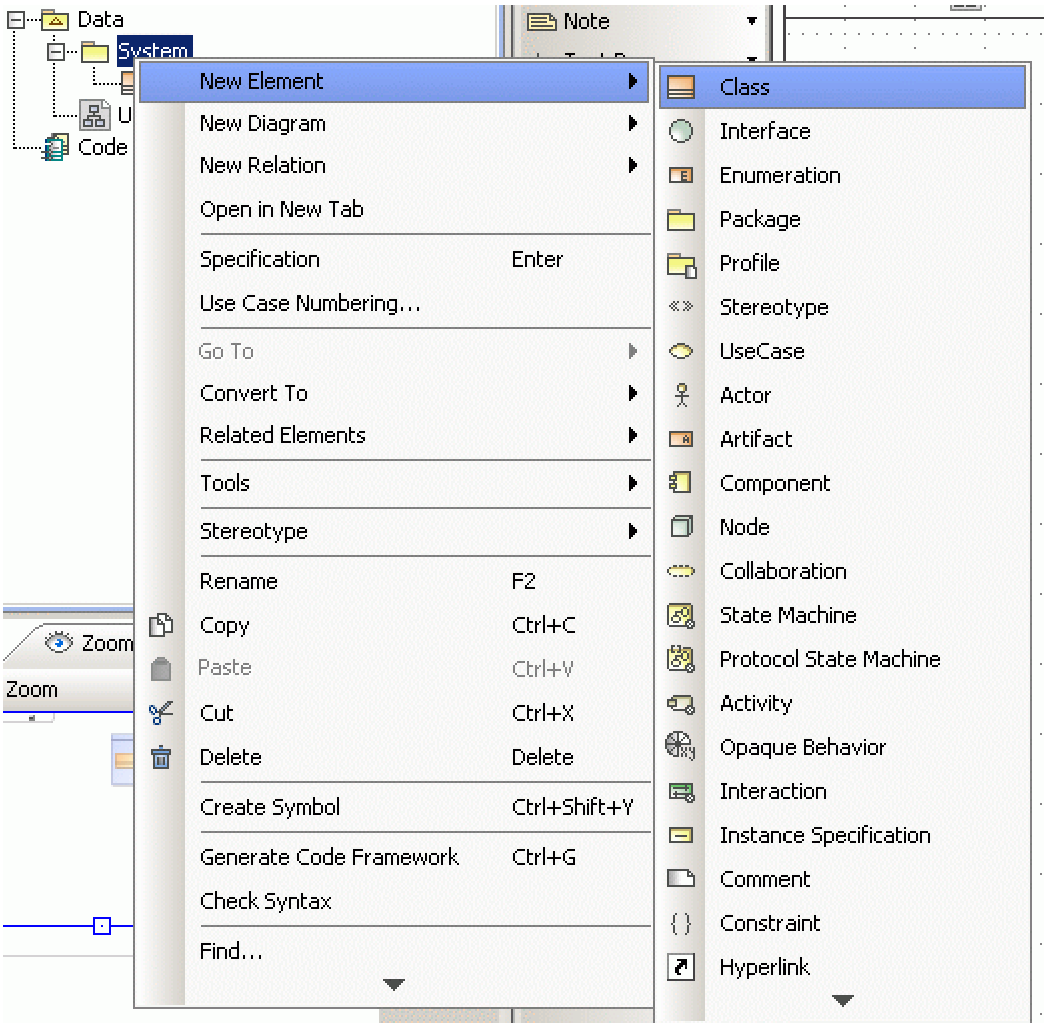

System
Customer
Specification Enter
Symbol(s) Properties... Alt+Enter
New Diagram
Go To
Select in Containment Tree Alt+B
Related Elements
Convert To
Tools
Stereotype
Create Roles
Presentation Options
Insert New Attribute Ctrl+Alt+A
Insert New Operation Ctrl+Alt+O

4. The class name becomes marked by dark blue fill in the Browser tree.



STEP #4 Create new class element from browser

1. Right-click the *System* package symbol in the Browser tree. From the shortcut menu, choose the **New Element** option and then **Class**.



2. A new class in the package will appear in the Browser tree. Name the class *Ticket*.
3. Select the class in Browser and drag it onto the Diagram pane into the package.

STEP #5 Draw relationships

1. In the diagram toolbar, click on the **Association** button . Connect the two classes with this path. If it is allowed to draw the link from one element to another, a blue border appears around it.

NOTE	You can draw some paths by clicking handler buttons on the class symbol.

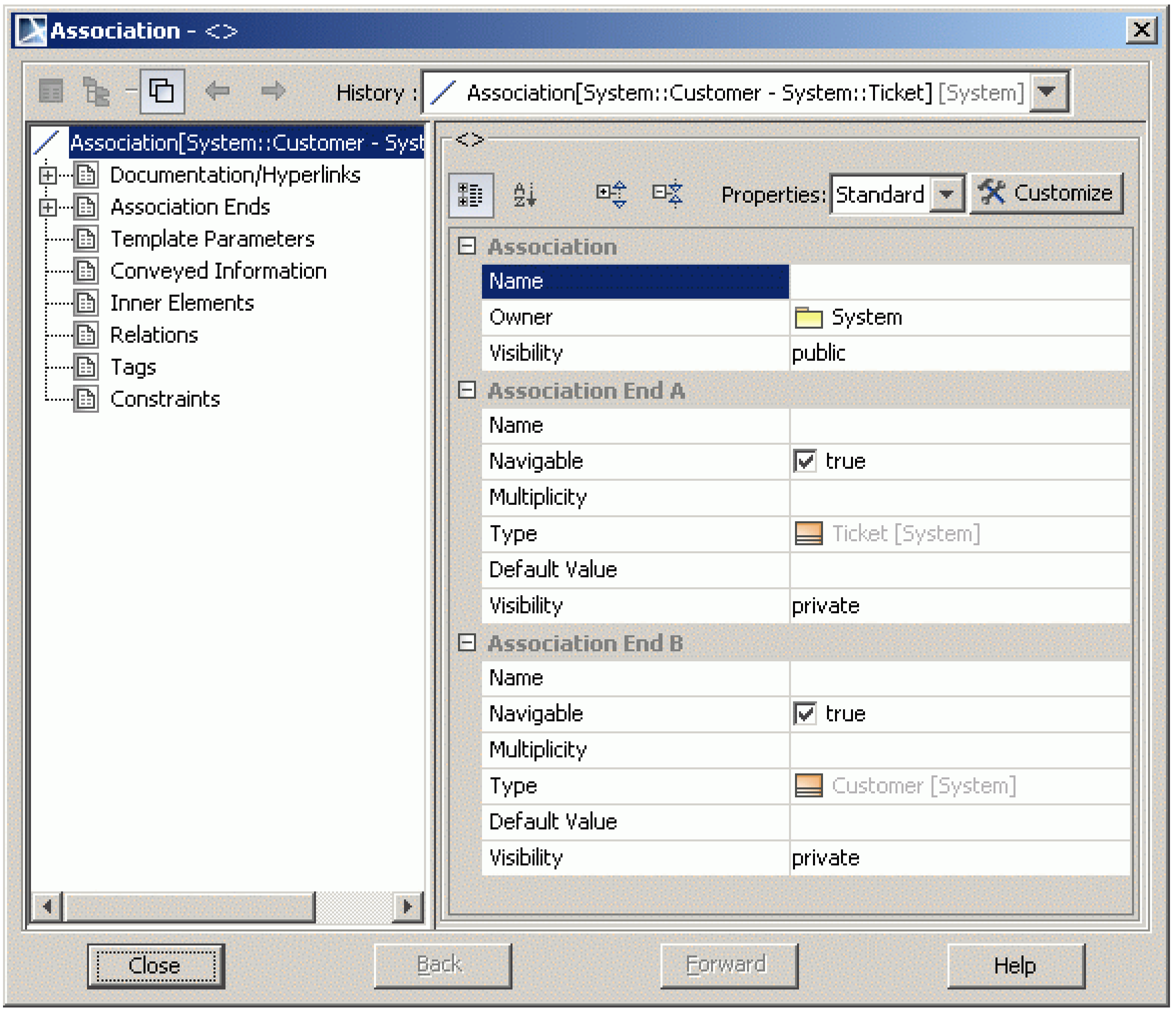
2. To change the style of the path, click on special buttons

in the toolbar.

3. Double click on the path. The **Association Specification** dialog box appears.

NOTE:	For more detailed information about this dialog box, see MagicDraw Help

.



Association - <>

History : Association[System::Customer - System::Ticket] [System]

- Association[System::Customer - Syst
  - Documentation/Hyperlinks
  - Association Ends
  - Template Parameters
  - Conveyed Information
  - Inner Elements
  - Relations
  - Tags
  - Constraints

<>

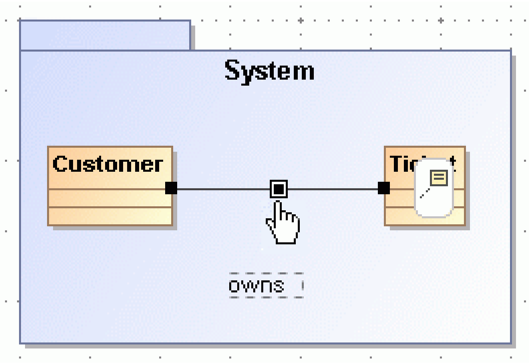
Properties: Standard

Association	
Name	
Owner	System
Visibility	public
Association End A	
Name	
Navigable	☑ true
Multiplicity	
Type	Ticket [System]
Default Value	
Visibility	private
Association End B	
Name	
Navigable	☑ true
Multiplicity	
Type	Customer [System]
Default Value	
Visibility	private

4. In the **Name** field, enter the path name *owns*. Click **Close**.
5. Drag the association name link around and leave it on the diagram pane. Select the link. From the main toolbar, using a special **Reset Labels Positions** button , put the path's name into place.

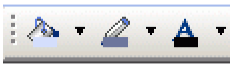
NOTE: The same action can be performed using handler on the link.

:



STEP #6 Presentation options

1. Click on a class to select it. On the toolbar, go to the symbol editing buttons

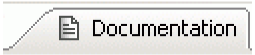


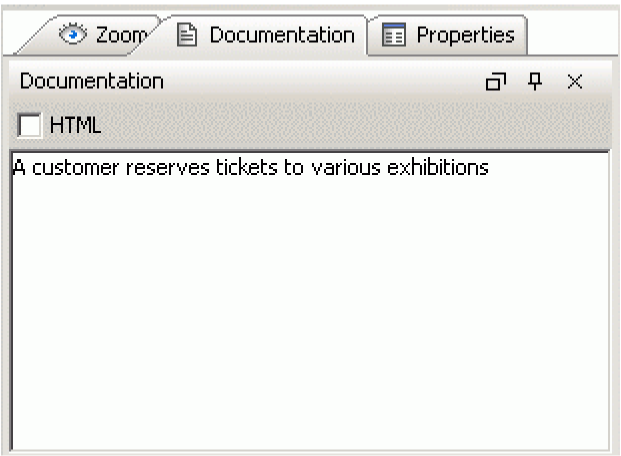
and click the **Fill Color**. Choose a color and click on it. The class fill color has been changed.

Note: If not all symbol editing buttons are displayed on the diagram toolbar, from the toolbar shortcut menu, select the **Expert Mode** check box.

2. Click on **Text Color**. Choose a color and click on it. The class text color has been changed.
3. Click on an association to select it. Go to symbol editing toolbar and click **Line Color**. Choose a color and click on it. The association line color has been changed.

STEP #7 Browser options

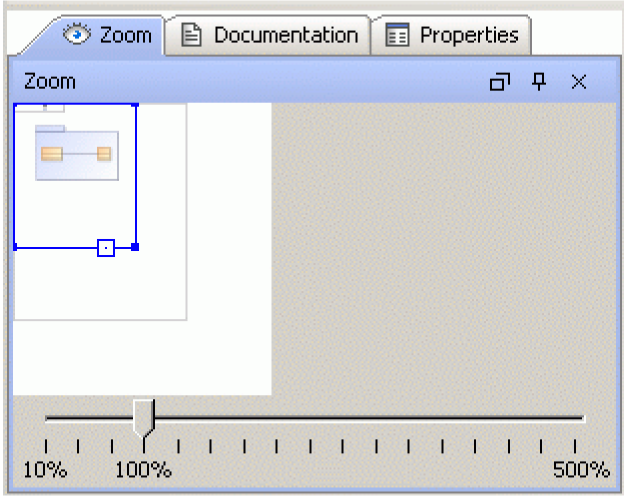
1. In the left down Browser, click on the **Documentation** tab  . The **Documentation** window will appear. Select a class containing the documentation. The documentation of a class will appear in the **Documentation** window.



□ HTML

A customer reserves tickets to various exhibitions

2. Click on the **Zoom** tab . The **Zoom** window will appear.



3. Zoom in/out the picture by dragging the slider of the sliding scale to over/under 100% or zoom in/out the picture by dragging the blue border around the diagram in Zoom window.

NOTE:	To add slider to the **Zoom** tab, from the **Options** main menu, choose **Environment** and in the opened dialog box, **Browser** group, select the **Show diagram zoom slider** check box.

SEQUENCE DIAGRAM CREATION

This guide contains step-by-step instructions, showing how to create a sequence diagram.

For creating a sequence diagram, an example of the Magic Test system will be given.

STEP #1 Create a Robustness diagram

1. Create a new project.
2. In the Browser tree, from the **Data** package shortcut m enu, choose **New Diagram** > **Custom Diagrams** > **Robustness Diagram**. Name the Robustness diagram as *Magic Test*.
3. In the diagram draw elements, displayed in the Figure 1 on page 15.

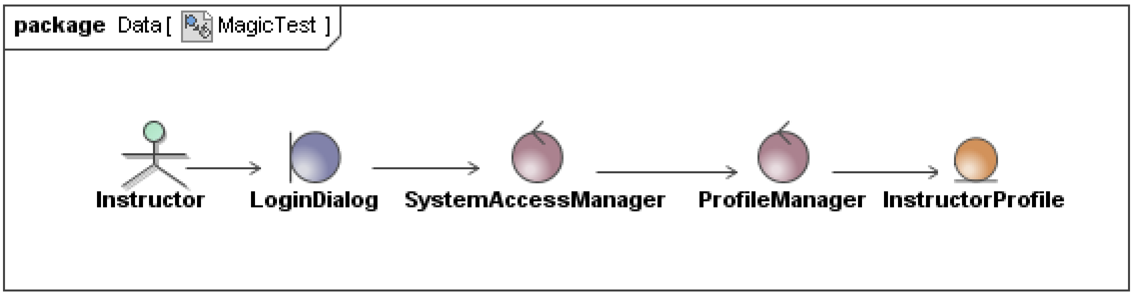


Figure 1 -- The Design robustness diagram

STEP #2 Create sequence diagram

1. In the Browser tree, from the Data package shortcut menu, choose New Diagram > Sequence Diagram.
2. Name diagram as *Change Password*.

STEP #3 Create lifelines

i. Try below listed lifelines creation ways:

- Drag and drop the *Instructor* actor from the Browser to the diagram pane (Note: you can also perform this action for multiple selection).
- Draw lifeline from the diagram toolbar:

  1.) In the sequence diagram toolbar, click the **Lifeline** button .

  2.) Click on the diagram pane in order to draw a shape.

  3.) From the lifeline shortcut menu select **Type** drop down list and select lifeline type *Instructor*.

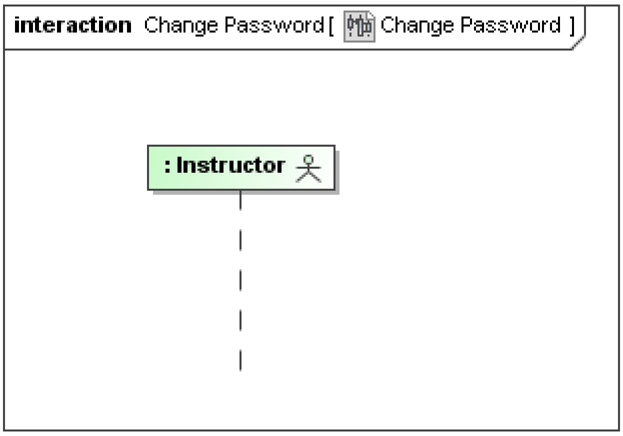


Figure 2 -- The Change Password sequence diagram, lifeline with Instructor type

ii. In the same way in the sequence diagram create lifelines for the *LoginDialog*, *SystemAccessManager*, *ProfileManager*, *InstructorProfile* elements.

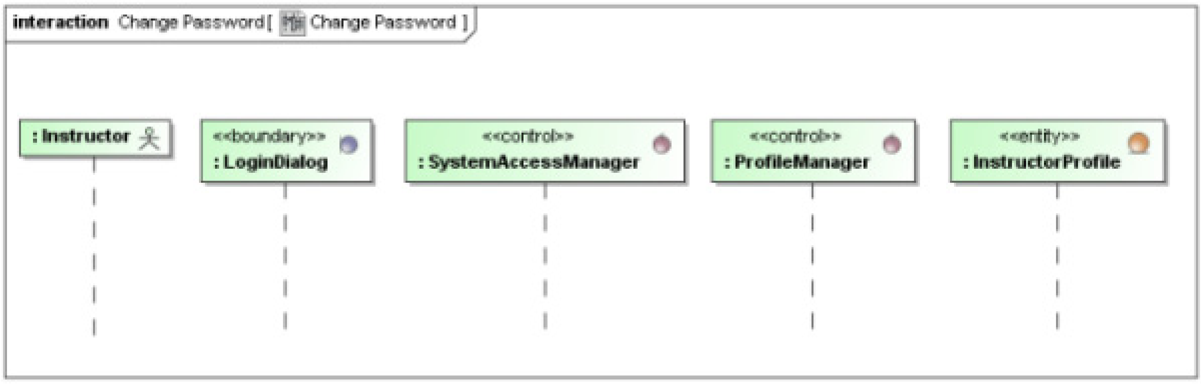


Figure 3 -- The Change Password sequence diagram

iii. You can display Image instead of lifeline shape. To change the lifeline representation on the diagram pane:

1. On the diagram pane from the lifeline shortcut menu select **Symbol(s) Properties**. The **Properties** dialog opens.
2. Change the **Show Stereotypes** property to **Shape Image**.
3. Change the same property for the rest of lifelines.

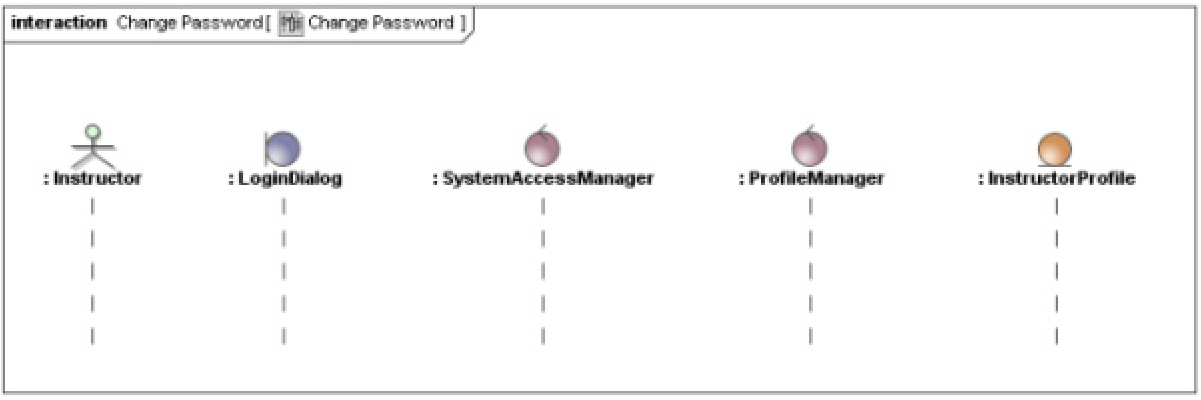


Figure 4 -- The Change Password sequence diagram - images displayed instead of Lifeline shapes

STEP #4 Link messages and alternative fragment

i. Create *Instructor* message to *LoginDialog*:

1. Click the **Message** button Message and draw message from *Instructor* to *LoginDialog*.
2. Type in message name as *Type in new password twice*.

ii. Create *LoginDialog* message to itself:

1. Click the **Message to self** button Message to self and click on *LoginDialog* lifeline.
2. Click on created message name and click the green balloon on the right - the **Operation** dialog will appear.
3. Type in operation name as *isPasswordsEquals* and set **Type** value to *boolean*. Close dialog box.
4. Click on operation name on the message and press **Spacebar** to edit text field. Edit message name to match *equals = isPasswordEquals()*.

iii. Create alternative fragment.

1. Click the **Alternatives** button Alternatives and draw alternatives fragmetn from *LoginDialog* to I*nstructorProfile*.
2. Click on empty brackets and type in *equals = = true*.

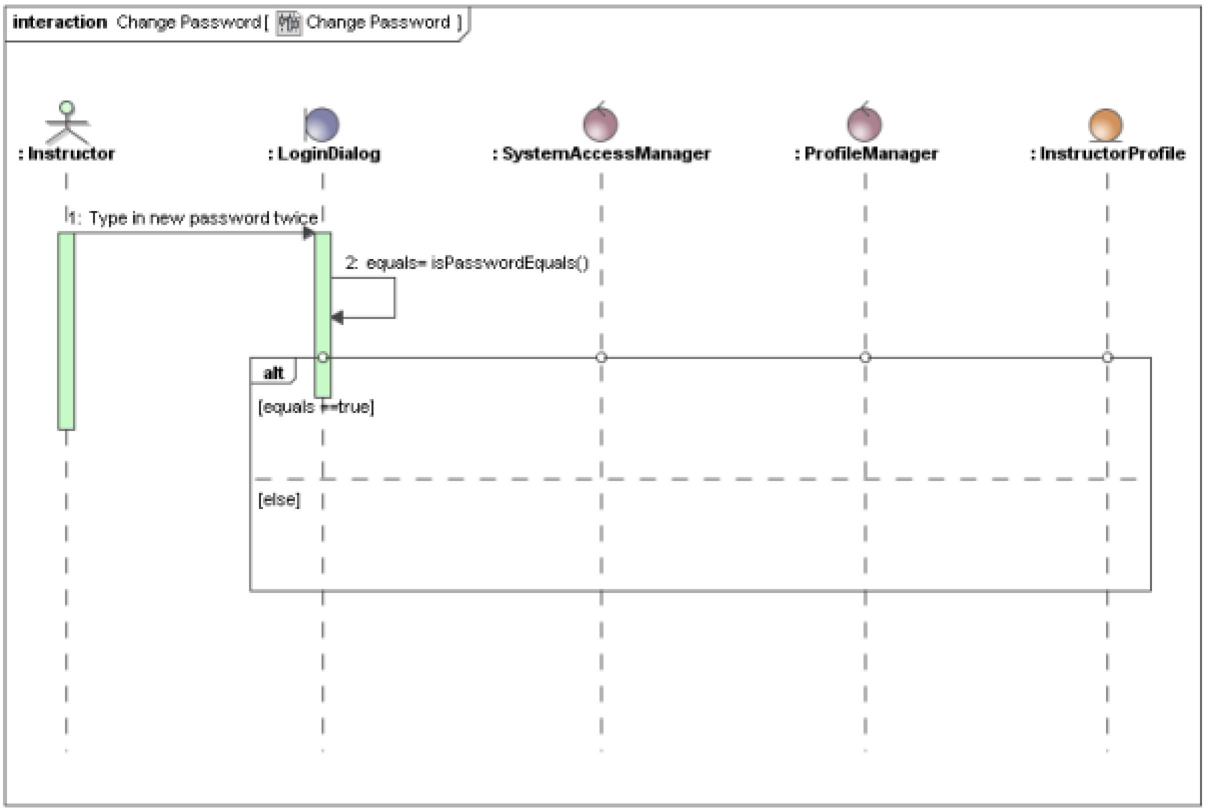

interaction Change Password [Change Password]
: Instructor
: LoginDialog
: SystemAccessManager
: ProfileManager
: InstructorProfile
1: Type in new password twice
2: equals= isPasswordEquals()
alt
[equals ==true]
[else]

Figure 5 -- The Change Password sequence diagram

iv. Create *changePassword()* call message from *LoginDialog* to *SystemAccessManager*.

1. Click the **Call Message** Call Message button and draw message from *LoginDialog* to *SystemAccessManager*.
2. Create new operation *changePassword()* with type *boolean*.

v. Create the rest of the messages:

1. Repeat the first step to create *changePassword()* call message from *SystemAccessManager* to *ProfileManager* and *setPassword()* call message from *ProfileManager* to *InstructorProfile*.
2. Create reply messages to return changed variable to *LoginDialog*.
3. Create showPasswordChangeMessage and showErrorMessage

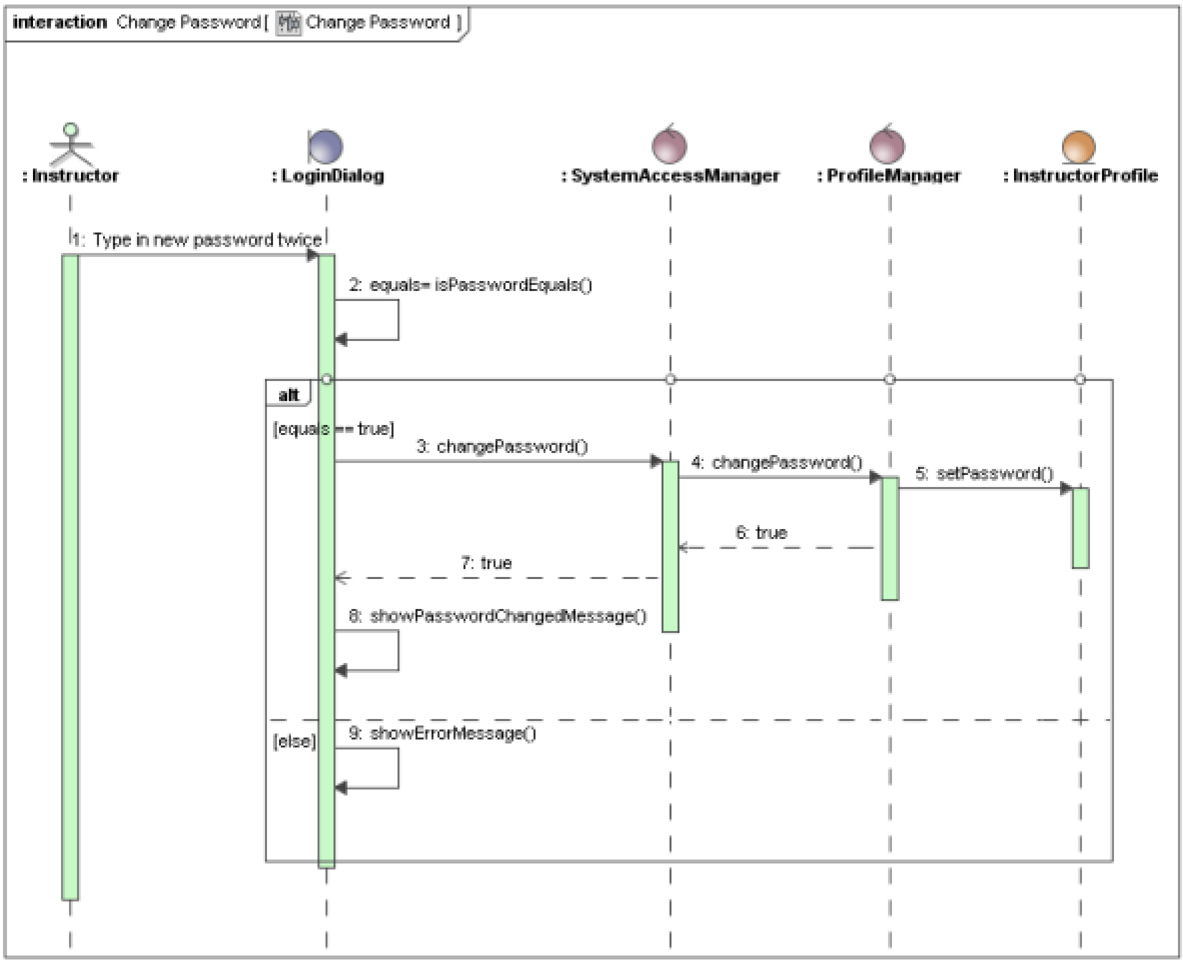


Figure 6 -- The Change Password sequence diagram

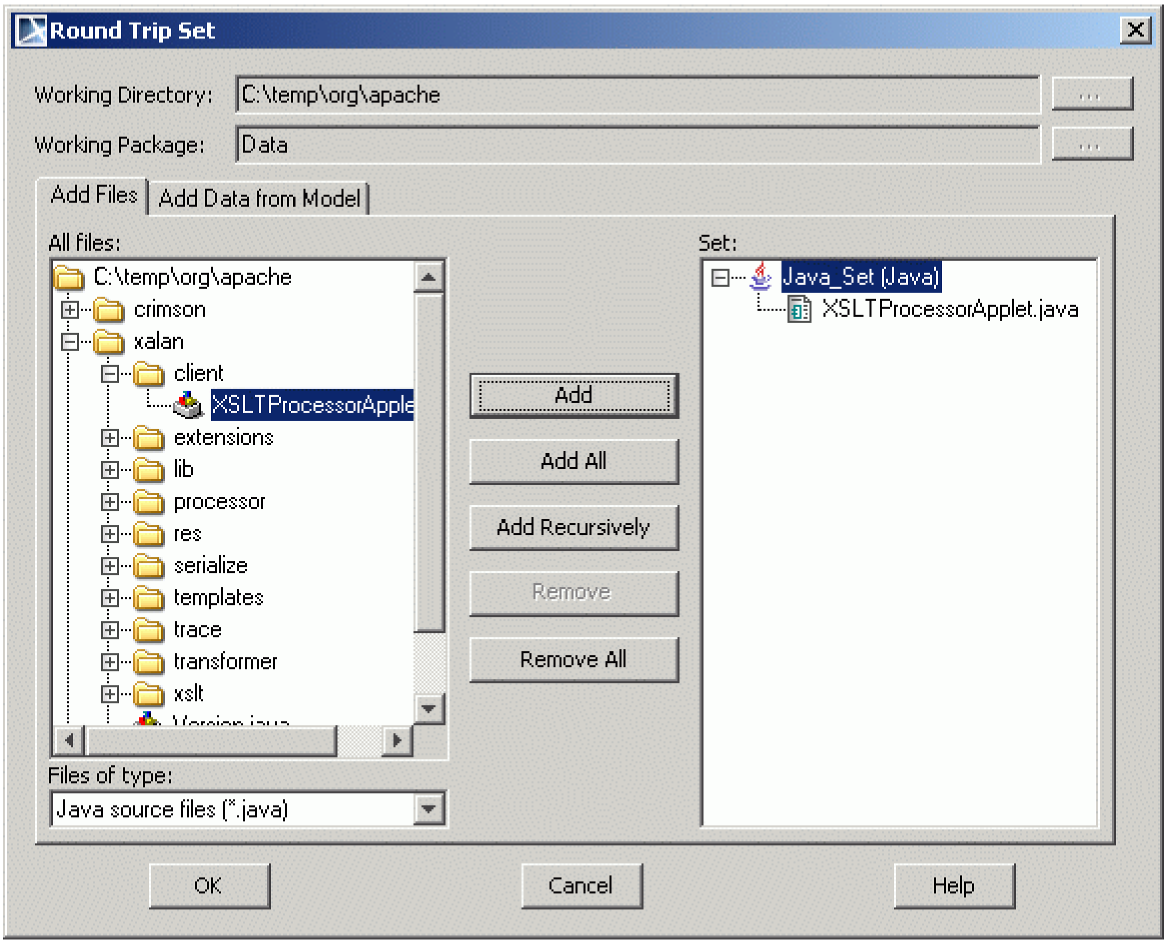
JAVA REVERSE TO SEQUENCE DIAGRAM

NOTE: This functionality is available in Enterprise edition only.

A particular java source code file will be used to show how java reverse to sequence diagram is performed - extracted src.zip file from java home directory.

STEP #1 Create code engineering set

1. Create a new project in MagicDraw.
2. In the Browser tree, from the **Code Engineering Sets** shortcut menu, choose **New.** Type the name of the java set in Browser.
3. From the newly created set shortcut menu, choose **Edit**. The **Round Trip Set** dialog box appears. .



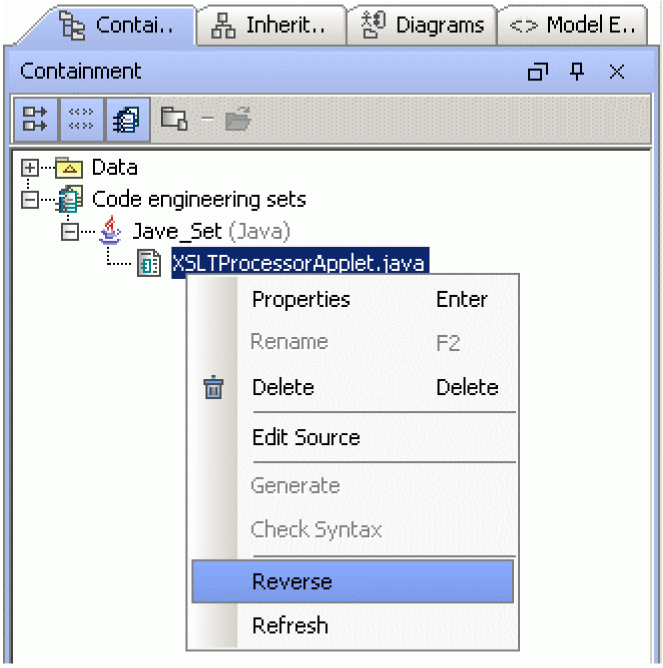
Round Trip Set

Working Directory: C:\temp\org\apache

Working Package: Data

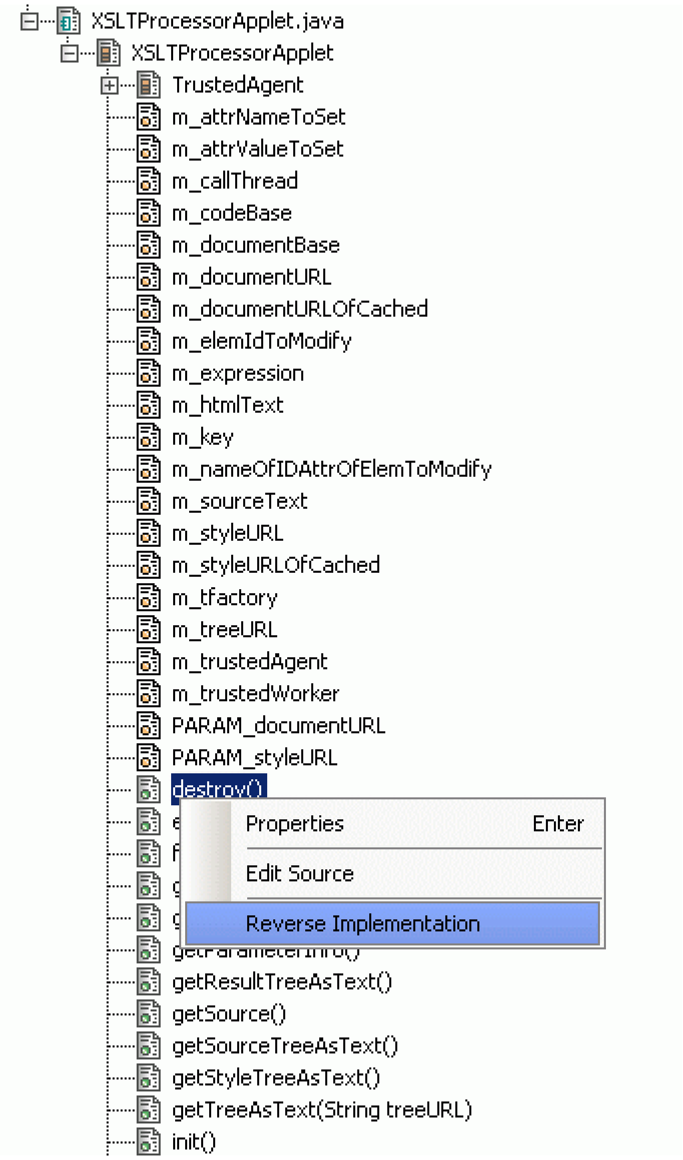
4. In the **Add Files** tree, select java file and add it to the **Set** list. Click **OK**. Class source files is added to the java set in Browser.

5. From the java source file shortcut menu, choose **Reverse**, define reverse options and click **OK.** A new model with packages and classes will be created in the project.

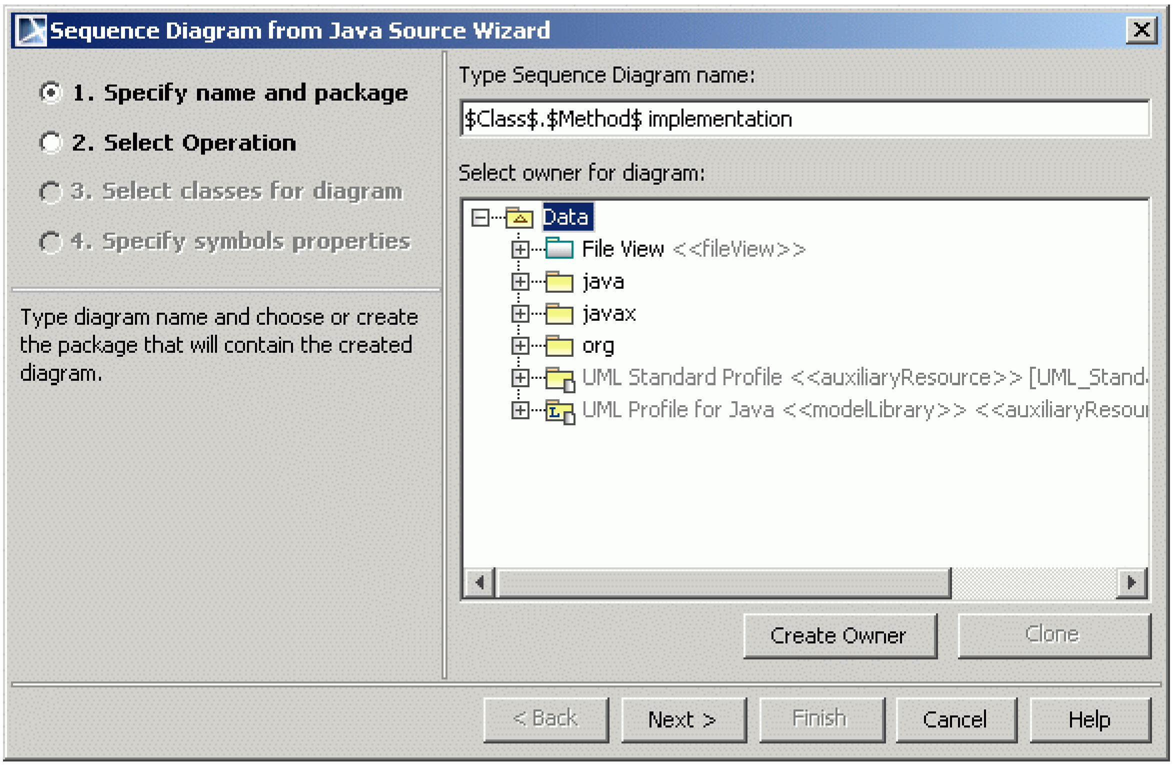


STEP #2 Create sequence diagram from java source

1. In the **Code Engineering Sets** tree, expand the java file structure and from the class method shortcut menu, choose the **Reverse Implementation** command.



2. The **Sequence Diagram from Java Source Wizard** appears.



Sequence Diagram from Java Source Wizard

- ● 1. Specify name and package
- ○ 2. Select Operation
- ○ 3. Select classes for diagram
- ○ 4. Specify symbols properties

Type diagram name and choose or create the package that will contain the created diagram.

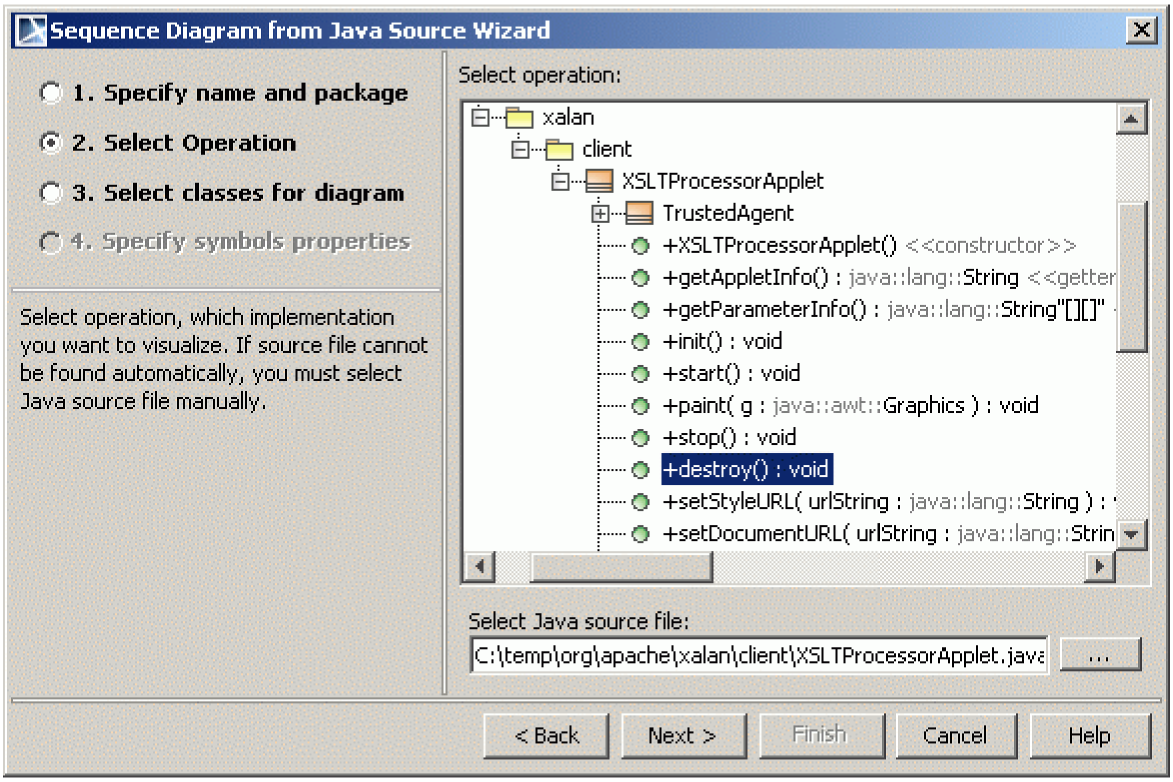
Type Sequence Diagram name: $Class$.$Method$ implementation

Select owner for diagram:

- Data
  - File View <<fileView>>
  - java
  - javax
  - org
  - UML Standard Profile <<auxiliaryResource>> [UML_Stand
  - UML Profile for Java <<modelLibrary>> <<auxiliaryResou

- The same wizard can be opened from the **Diagrams** main menu by choosing **Diagram Wizards** command, from the **Tools** main menu, choosing **Model Visualizer**, or from the method shortcut menu in the Browser, choosing the **Reverse Implementation** command.

3. In the Step 1, specify the name of the sequence diagram and select the package, where this diagram will be created. By default, name of the class and method will be given to the sequence diagram. For example: *Class.Method implementation*. Click **Next.**
4. In the Step 2, select method (operation), which will be displayed in the sequence diagram. Specify the Java source file, if this file cannot be found automatically. Click **Next.**



Sequence Diagram from Java Source Wizard

- ○ 1. Specify name and package
- ● 2. Select Operation
- ○ 3. Select classes for diagram
- ○ 4. Specify symbols properties

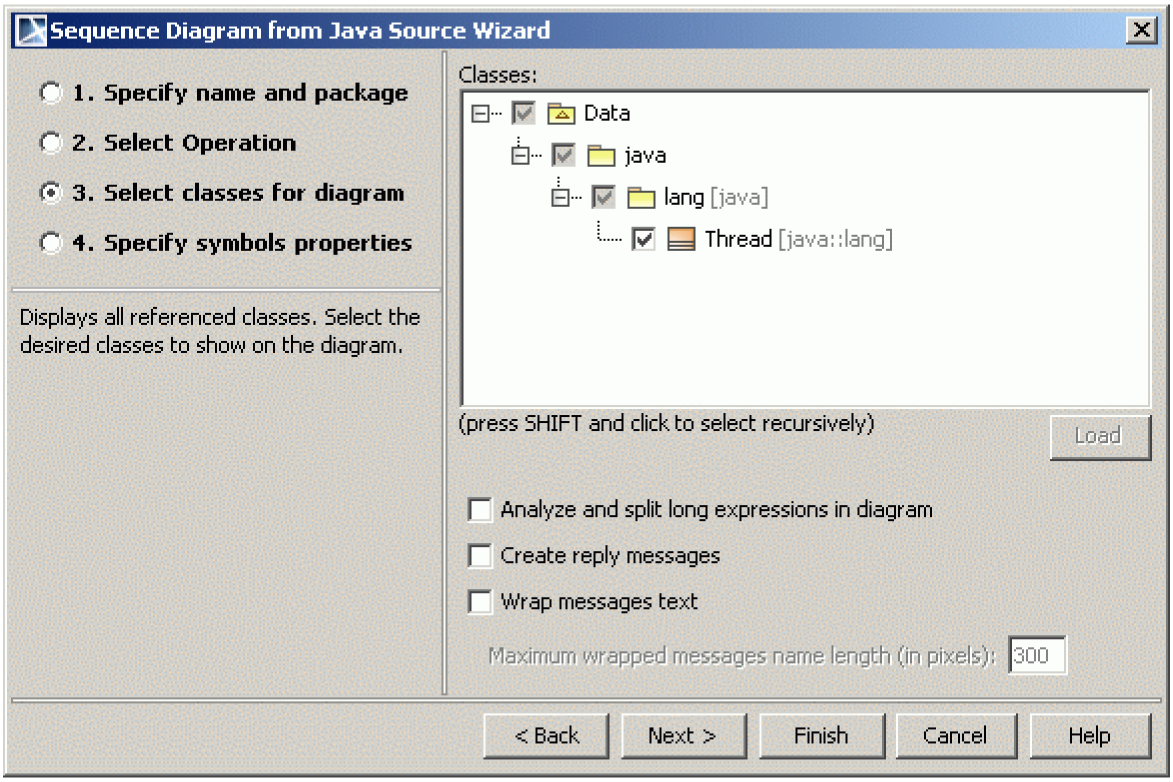
Select operation, which implementation you want to visualize. If source file cannot be found automatically, you must select Java source file manually.

Select operation:

- xalan
  - client
    - XSLTProcessorApplet
      - TrustedAgent
      - +XSLTProcessorApplet() <<constructor>>
      - +getAppletInfo() : java::lang::String <<getter
      - +getParameterInfo() : java::lang::String"[][]"
      - +init() : void
      - +start() : void
      - +paint(g : java::awt::Graphics) : void
      - +stop() : void
      - +destroy() : void
      - +setStyleURL(urlString : java::lang::String) :
      - +setDocumentURL(urlString : java::lang::Strin

Select Java source file: C:\temp\org\apache\xalan\client\XSLTProcessorApplet.jave

5. In the Step 3, select other referenced classes, which you want to be displayed in the diagram.



Sequence Diagram from Java Source Wizard

- ○ 1. Specify name and package
- ○ 2. Select Operation
- ● 3. Select classes for diagram
- ○ 4. Specify symbols properties

Displays all referenced classes. Select the desired classes to show on the diagram.

Classes:

- ☑ Data
  - ☑ java
    - ☑ lang [java]
      - ☑ Thread [java::lang]

(press SHIFT and click to select recursively)

□ Analyze and split long expressions in diagram

□ Create reply messages

□ Wrap messages text

Maximum wrapped messages name length (in pixels): 300

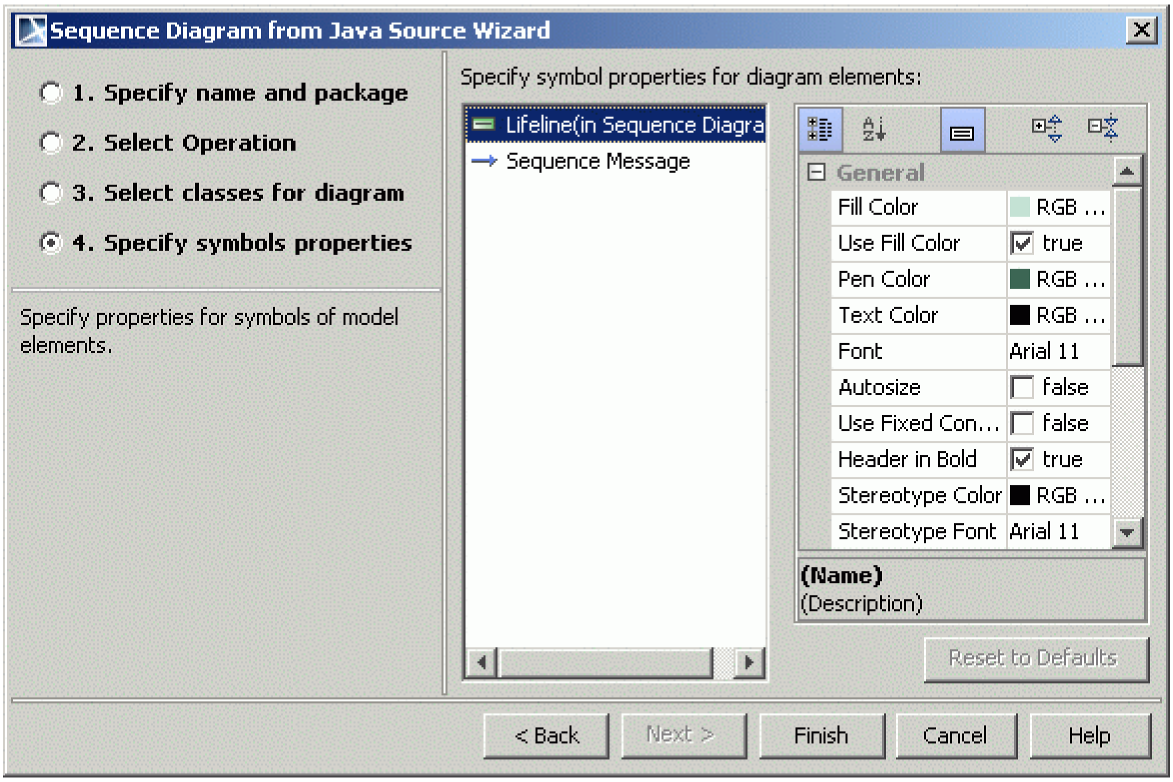
Click **Next.**

Select the **Analyze and split long expressions in diagram** check box if expression contains calls and cannot be displayed as call message. Then every call will be shown as separate call message with temporary variable initialization.

Select the **Create reply message** check box, if you want to display reply message for every call message.

Select the **Wrap messages text** check box and specify the maximum message text length in pixels, to wrap longer message.

6. In the Step 4, specify the presentation style for elements in created diagram.



Sequence Diagram from Java Source Wizard

○ 1. Specify name and package
○ 2. Select Operation
○ 3. Select classes for diagram
● 4. Specify symbols properties

Specify properties for symbols of model elements.

Specify symbol properties for diagram elements:

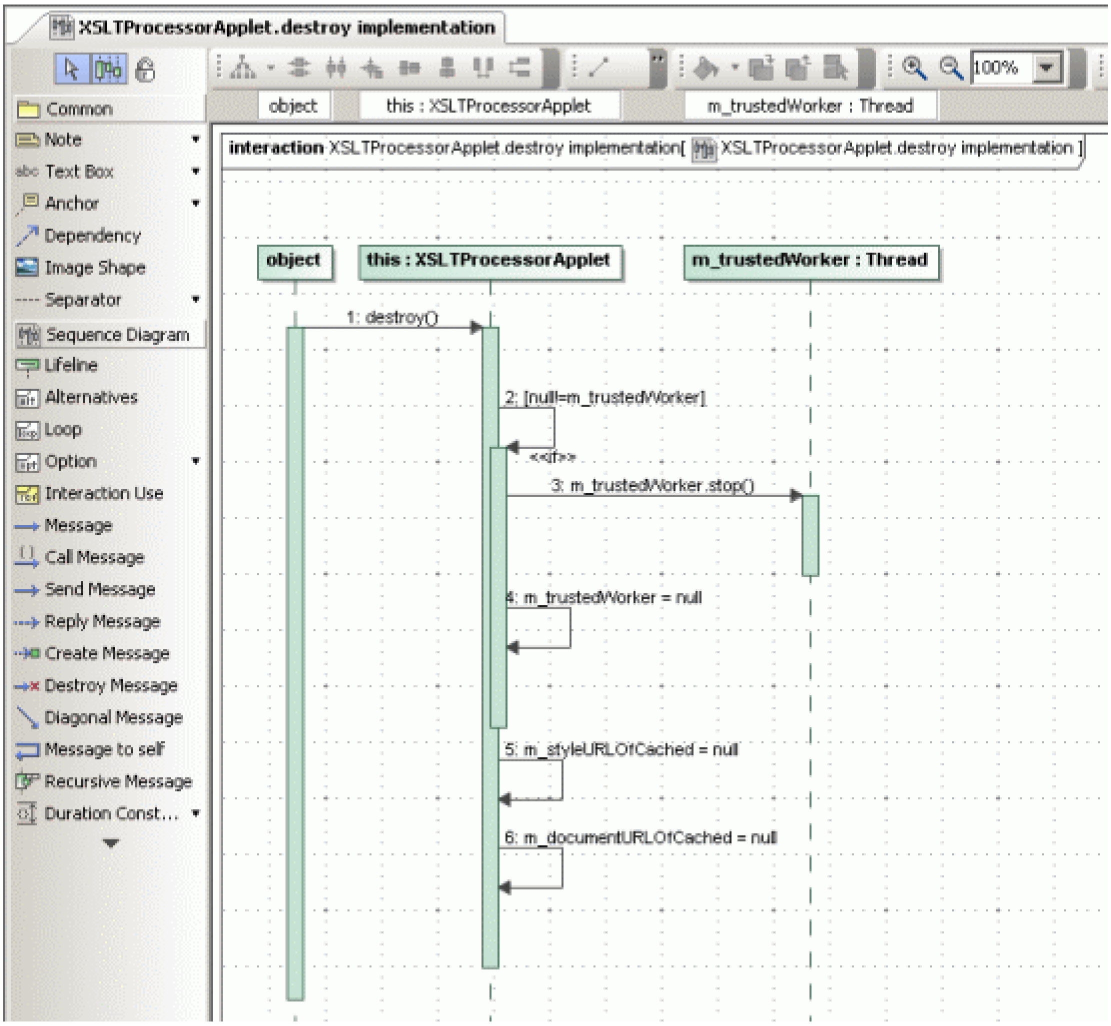
- Lifeline(in Sequence Diagra
- Sequence Message

⊟ General

Fill Color	RGB ...
Use Fill Color	☑ true
Pen Color	RGB ...
Text Color	RGB ...
Font	Arial 11
Autosize	□ false
Use Fixed Con...	□ false
Header in Bold	☑ true
Stereotype Color	RGB ...
Stereotype Font	Arial 11

(Name)
(Description)

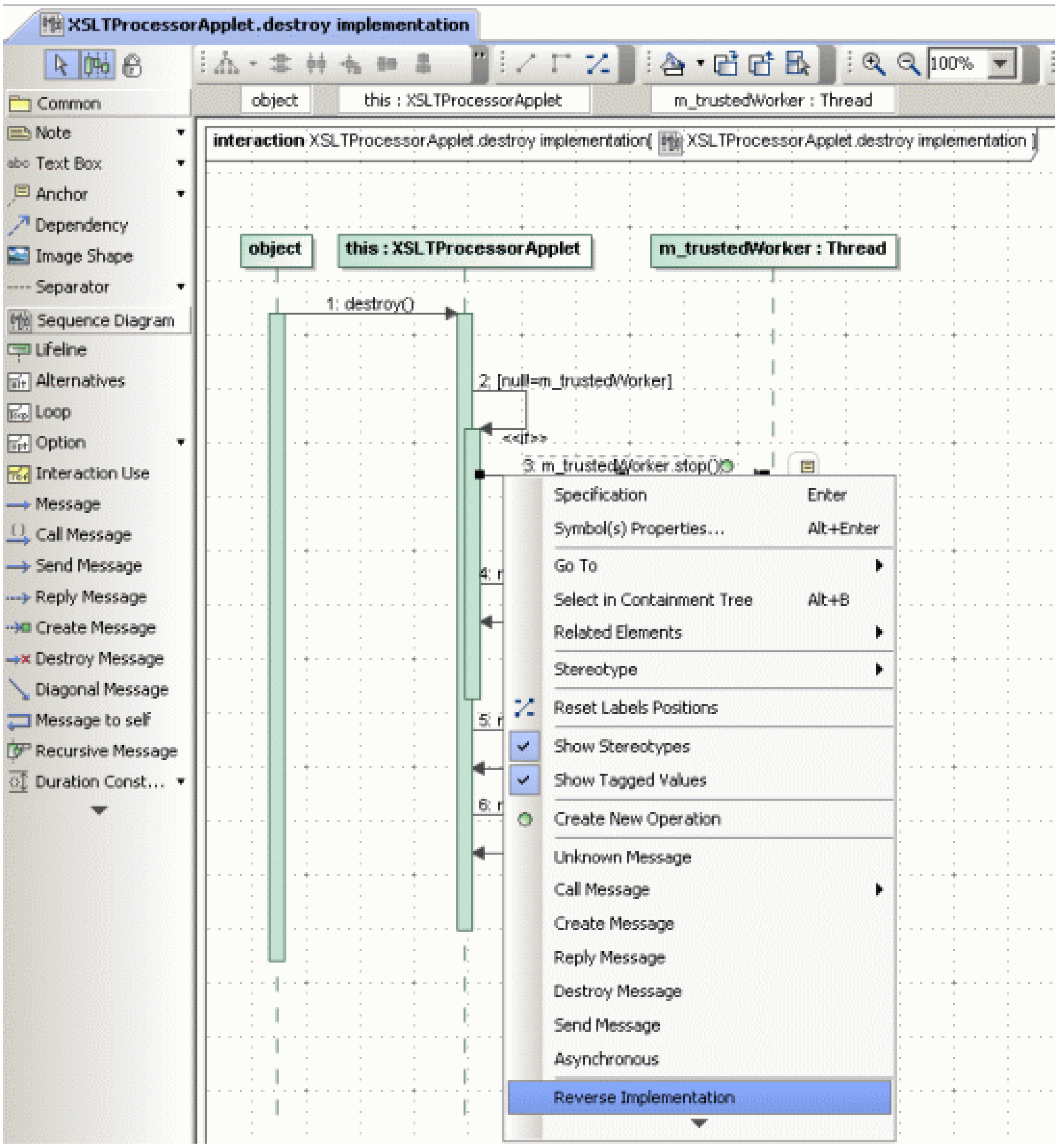
7. Click **Finish.** The sequence diagram is created.



STEP #3 Extend sequence diagram by method

1. In the diagram pane, select method (message), which you want to be displayed more detail including referenced classes and other defining methods.

2. From the message shortcut menu, choose **Reverse Implementation** command.



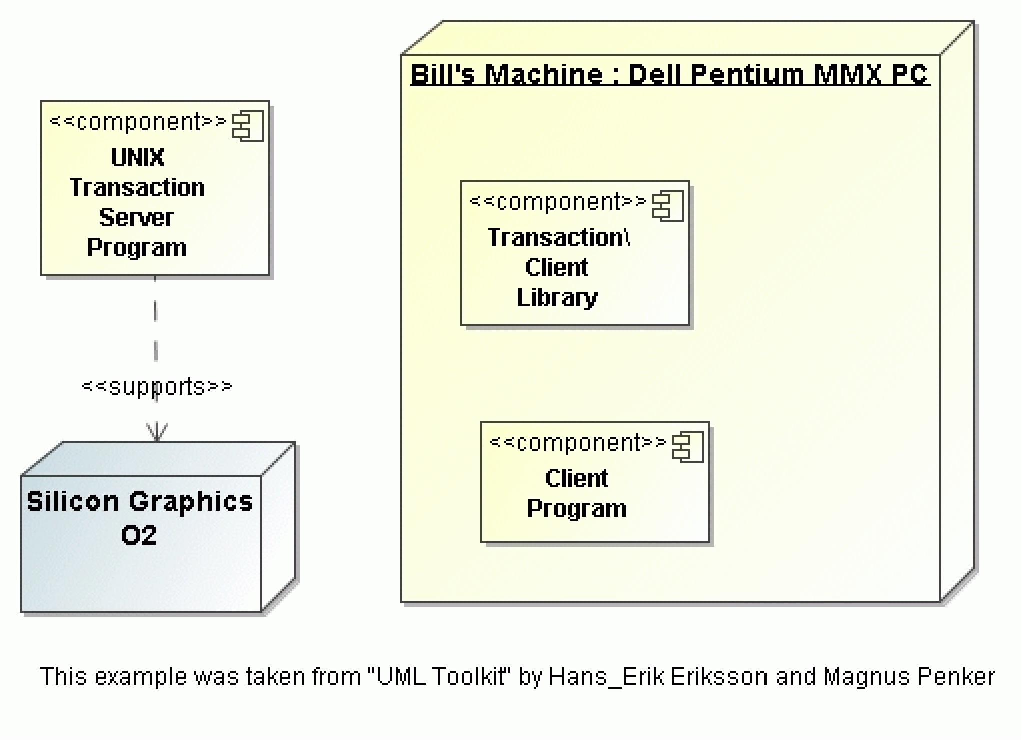
3. The **Sequence Diagram from Java Source Wizard** appears. Following instruction in Step 2, define wizard options and click **Finish**. Additional new elements, which define the selected method, are added to the sequence diagram.

APPLYING DIFFERENT COLORS

Diagrams may have a set of different types of elements. For example, in the class diagram you may draw packages and classes. All those elements can be colored in the same color that you chose for your views. To make diagrams more clear, you may color elements of different types with their own color.

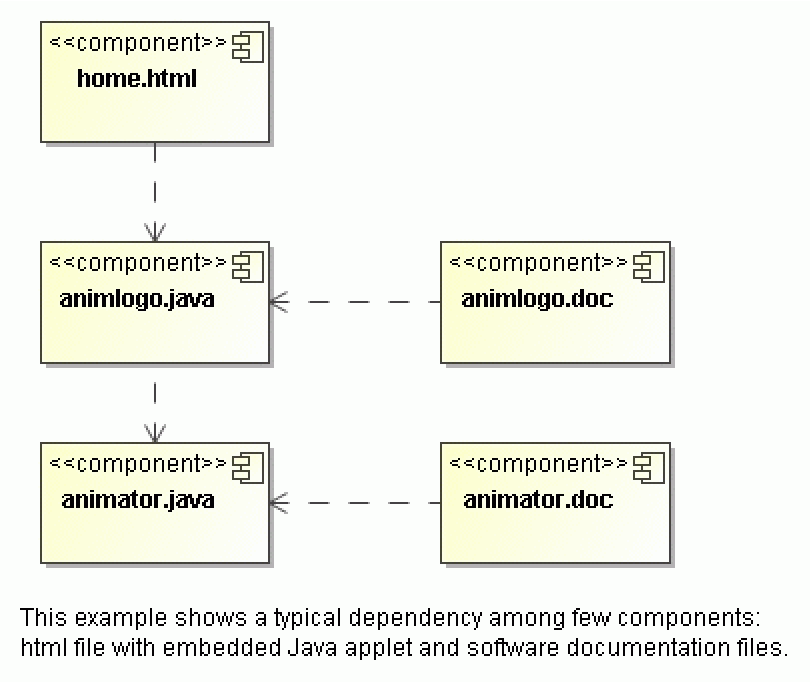
An example of two implementation diagrams, created in one project, will be used in this tutorial.

Implementation diagram, called *Workstations*:


Bill's Machine : Dell Pentium MMX PC
<<component>>
UNIX Transaction Server Program
<<component>>
Transaction\ Client Library
<<supports>>
Silicon Graphics O2
<<component>>
Client Program

This example was taken from "UML Toolkit" by Hans_Erik Eriksson and Magnus Penker

Implementation diagram, called *Java Files*:


<<component>>
home.html
<<component>>
animlogo.java
<<component>>
animlogo.doc
<<component>>
animator.java
<<component>>
animator.doc
This example shows a typical dependency among few components:
html file with embedded Java applet and software documentation files.

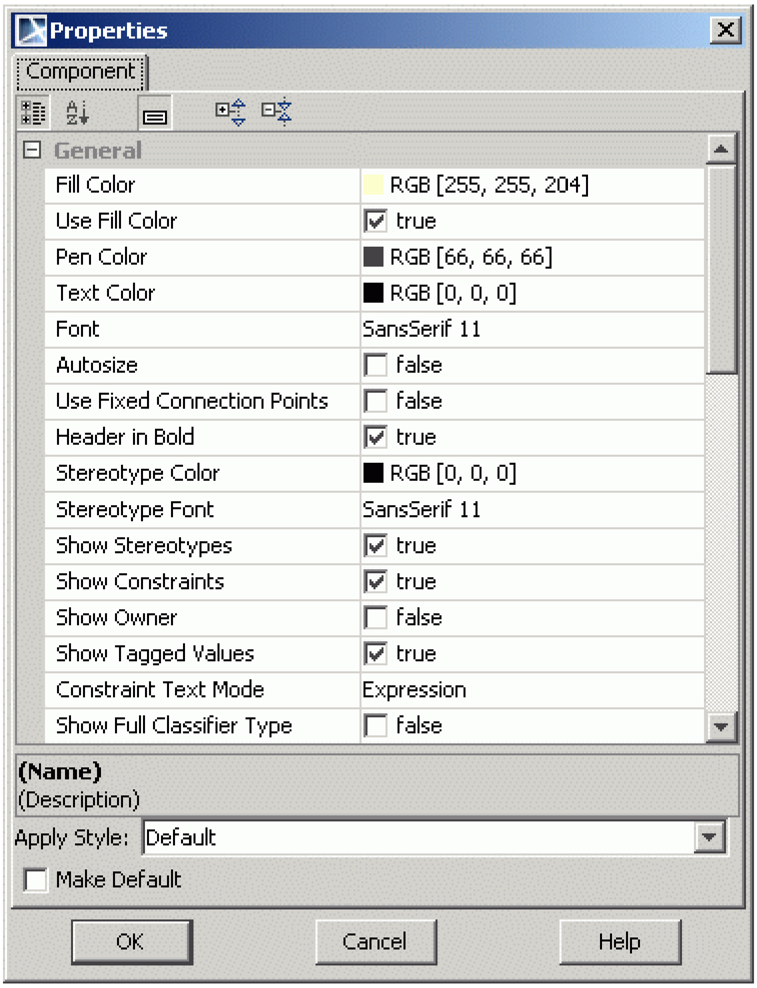
STEP #1 Select all analogous shapes

1. In the *Workstations* diagram, press and keep holding the **ALT** key.
2. On the **Diagram** pane, click the component instance *Client Program* element symbol. All analogous shapes are selected.

STEP #2 Open the Properties dialog box

1. When you have components selected, right-click the diagram and from the shape shortcut menu, choose **Symbol(s) Properties**.

2. The **Properties** dialog box appears:



General

Fill Color	RGB [255, 255, 204]
Use Fill Color	☑ true
Pen Color	RGB [66, 66, 66]
Text Color	RGB [0, 0, 0]
Font	SansSerif 11
Autosize	□ false
Use Fixed Connection Points	□ false
Header in Bold	☑ true
Stereotype Color	RGB [0, 0, 0]
Stereotype Font	SansSerif 11
Show Stereotypes	☑ true
Show Constraints	☑ true
Show Owner	□ false
Show Tagged Values	☑ true
Constraint Text Mode	Expression
Show Full Classifier Type	□ false

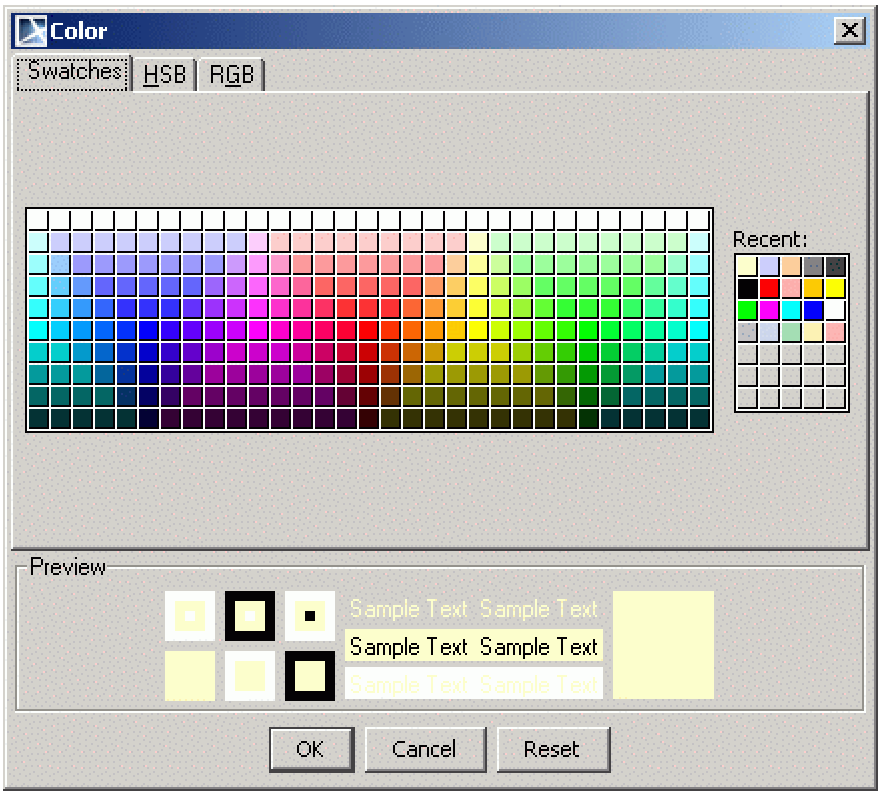
(Name)
(Description)

Apply Style: Default

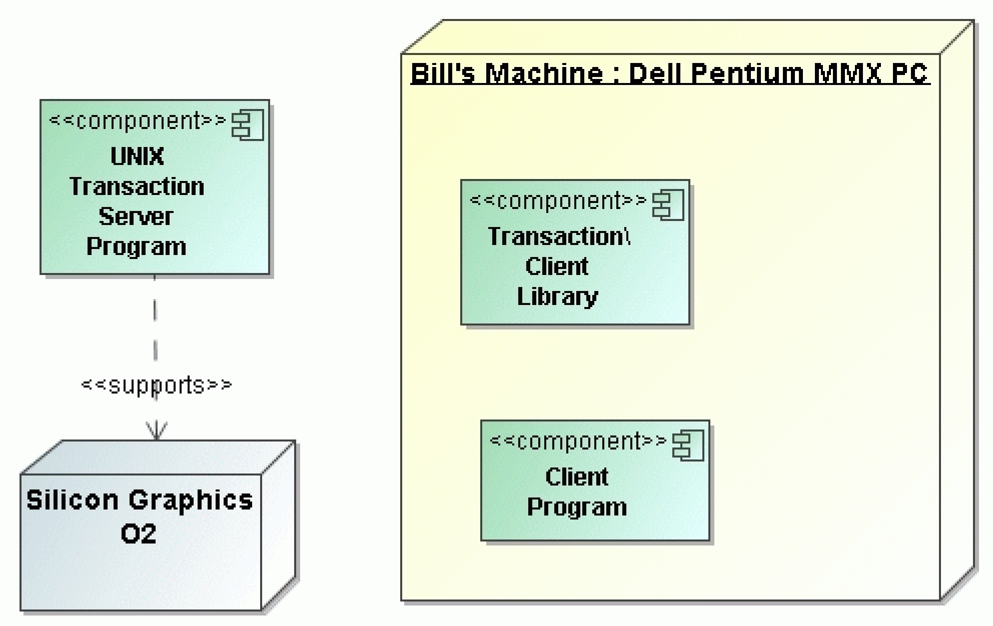
□ Make Default

STEP #3 Open the color dialog box

1. In the **Properties** dialog box, the **Fill Color** field, click the '**...**' button. The **Color** dialog box appears:



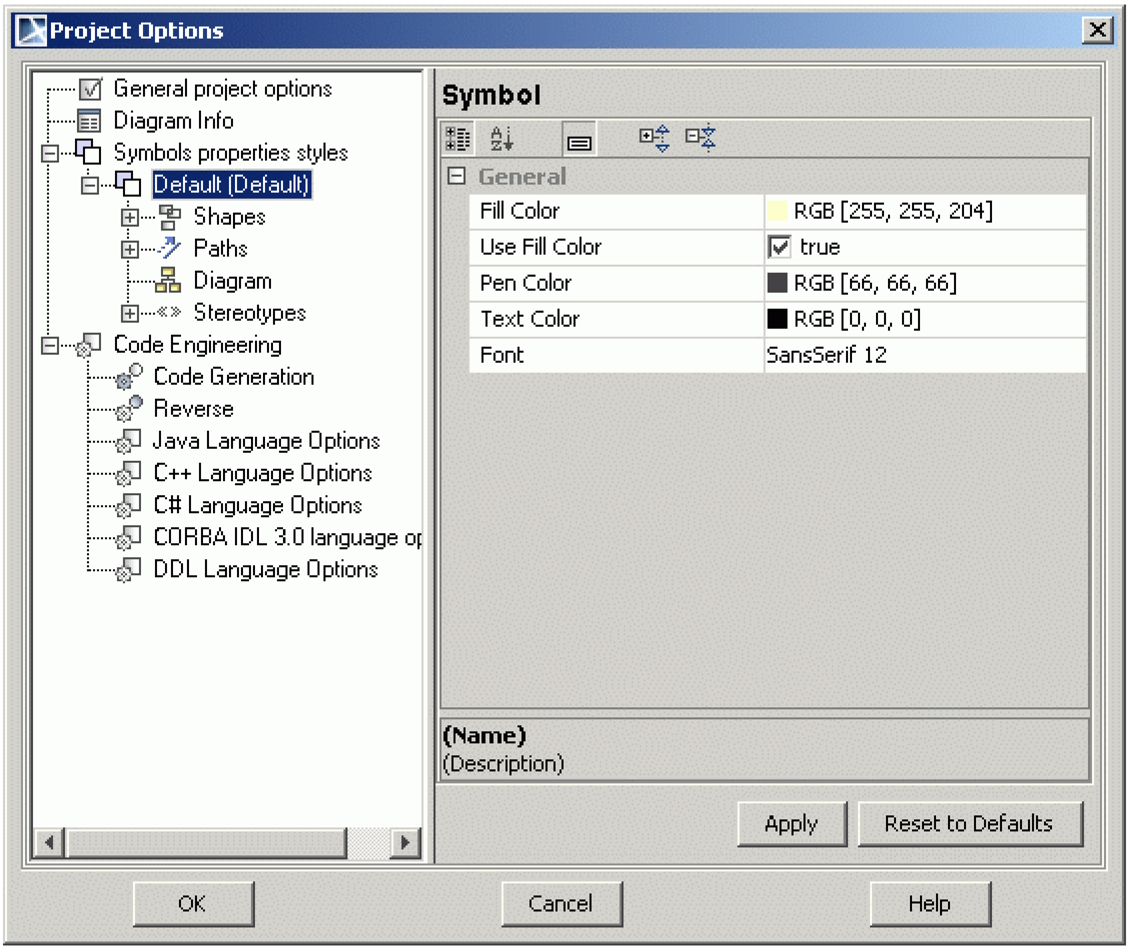
2. Choose the color you wish to be assigned to the element. Click **OK**.
3. In the **Properties** dialog box, click **OK**. The colors of the selected shapes will be changed.


Bill's Machine : Dell Pentium MMX PC
<<component>>
UNIX Transaction Server Program
<<supports>>
Silicon Graphics O2
<<component>>
Transaction\ Client Library
<<component>>
Client Program

NOTE	If you want to make the selected color as default for the newly created shapes, in the **Properties** dialog box select the **Make Default** check box.

STEP #4 Change properties using Project Options dialog box

1. From the **Options** main menu, choose **Project**. The **Project Options** dialog box appears.



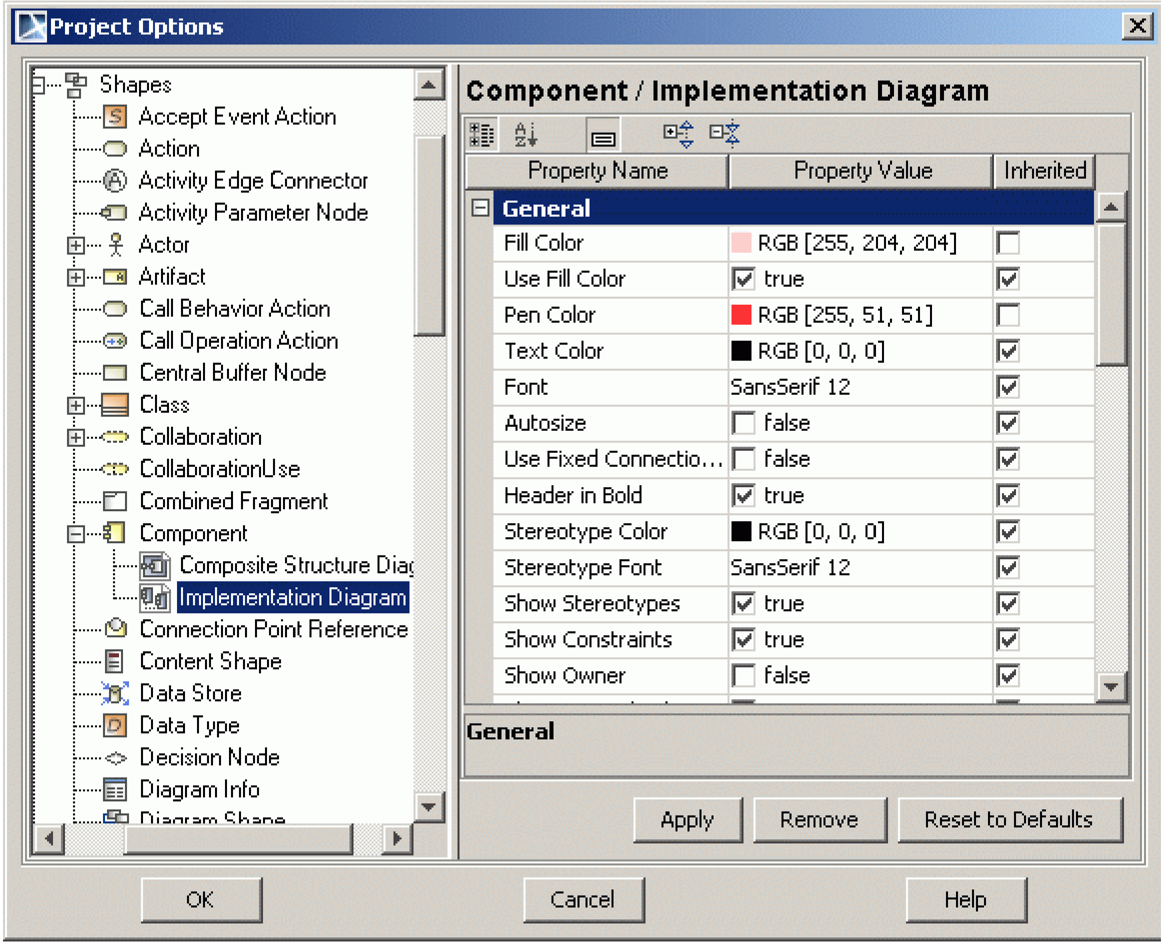
Fill Color	RGB [255, 255, 204]
Use Fill Color	☑ true
Pen Color	RGB [66, 66, 66]
Text Color	RGB [0, 0, 0]
Font	SansSerif 12

2. In the **General Project Options** tree, expand the **Shapes** section and select the **Component** element.

STEP #5 Extend properties by implementation diagram

1. From the **Component** shortcut menu, choose **Implementation** diagram. Style properties that may be applied to component element only in implementation diagram, appears.

2. Change the **Fill Color** and **Pen Color** properties values, by clicking the '**...**' button. The **Color** dialog box appears. Submit changes.



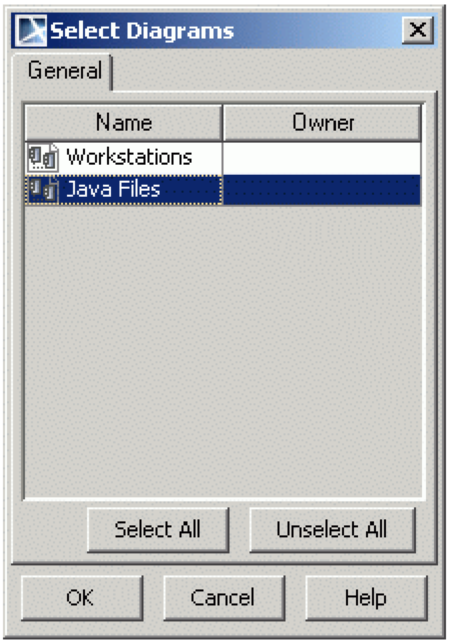
- Shapes
  - Accept Event Action
  - Action
  - Activity Edge Connector
  - Activity Parameter Node
  - Actor
  - Artifact
  - Call Behavior Action
  - Call Operation Action
  - Central Buffer Node
  - Class
  - Collaboration
  - CollaborationUse
  - Combined Fragment
  - Component
    - Composite Structure Diag
    - Implementation Diagram
  - Connection Point Reference
  - Content Shape
  - Data Store
  - Data Type
  - Decision Node
  - Diagram Info
  - Diagram Shape

Component / Implementation Diagram

Property Name	Property Value	Inherited
General		
Fill Color	▨ RGB [255, 204, 204]	□
Use Fill Color	☑ true	☑
Pen Color	🟥 RGB [255, 51, 51]	□
Text Color	■ RGB [0, 0, 0]	☑
Font	SansSerif 12	☑
Autosize	□ false	☑
Use Fixed Connectio…	□ false	☑
Header in Bold	☑ true	☑
Stereotype Color	■ RGB [0, 0, 0]	☑
Stereotype Font	SansSerif 12	☑
Show Stereotypes	☑ true	☑
Show Constraints	☑ true	☑
Show Owner	□ false	☑

General

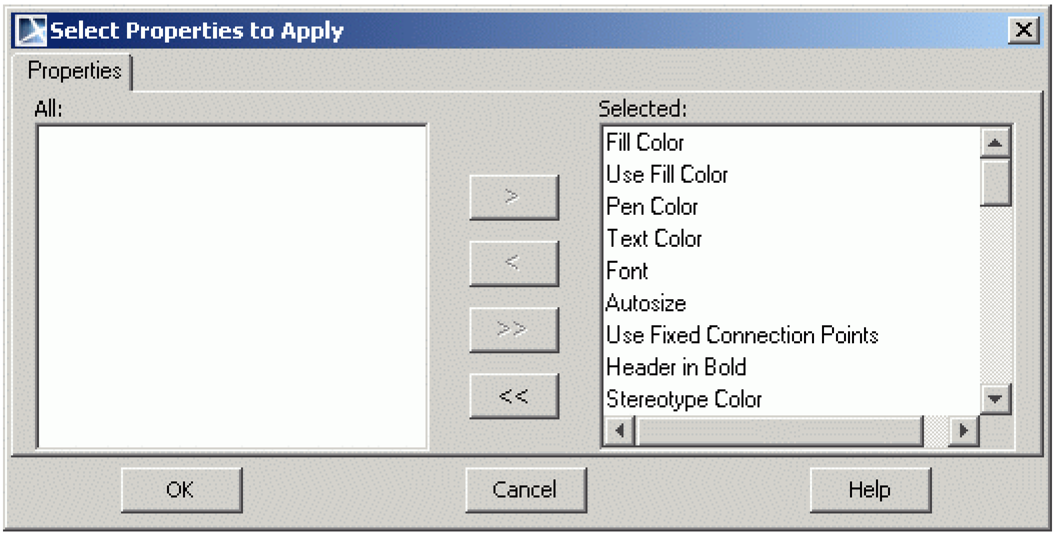
3. In the **Project Options** dialog box click the **Apply** button. The **Select Diagrams** dialog box appears.



Name	Owner
Workstations	
Java Files	

NOTE! Only Implementation diagrams are displayed in this list, because properties were extended by this type of diagram only.

4. Select the *Java Files* diagram and click **OK**. The **Select Properties to Apply** dialog box appears. By default, all properties are added to the **Selected** list.



Select Properties to Apply

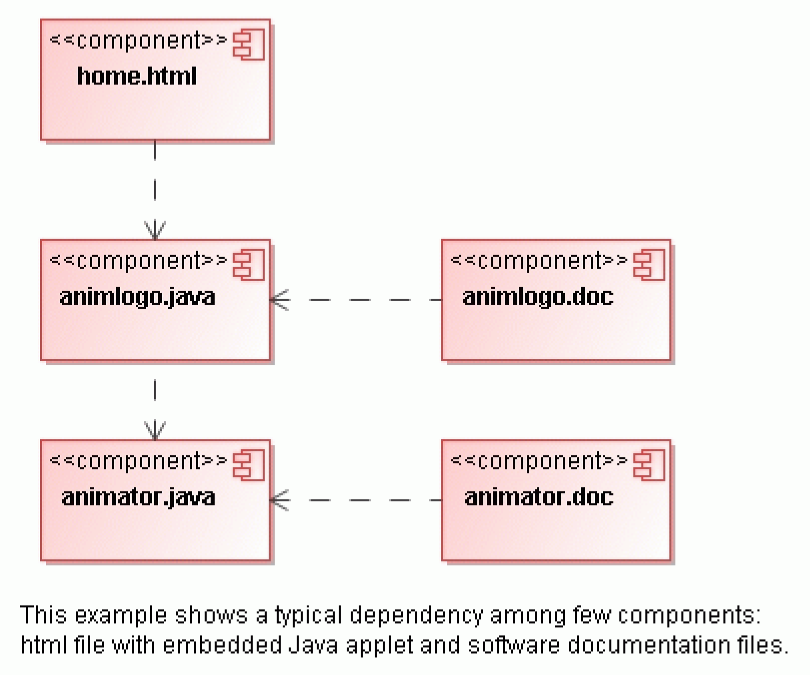
Properties

All:

Selected:
- Fill Color
- Use Fill Color
- Pen Color
- Text Color
- Font
- Autosize
- Use Fixed Connection Points
- Header in Bold
- Stereotype Color

NOTE! To apply not all properties, use the '**<** ' button and move irrelevant properties to the **All** list. Only selected properties existing in the **Selected** list will be applied.

5. To submit changes and close dialog boxes, click **OK.** Changes were made to component elements but only in *Java Files implementation* diagram.



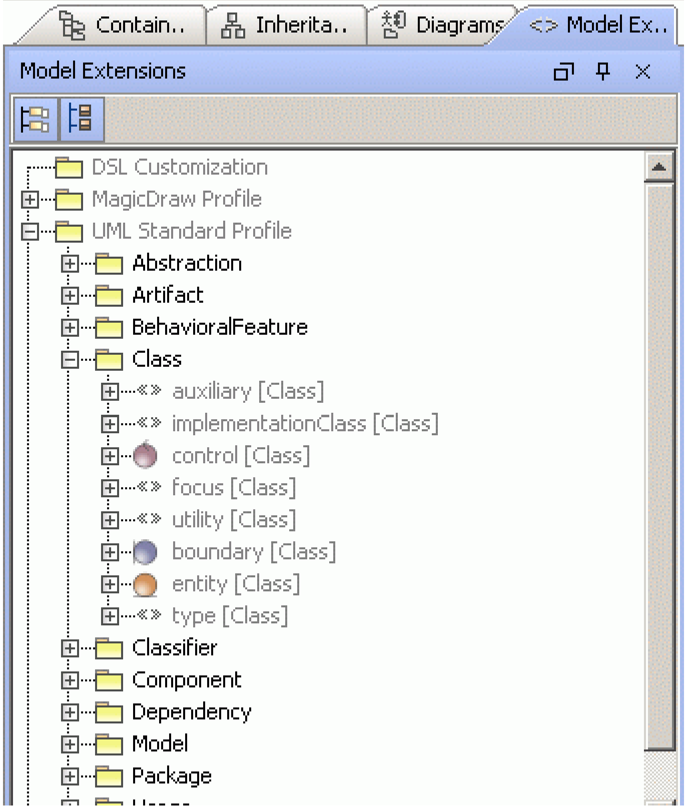
<<component>>
home.html
<<component>>
animlogo.java
<<component>>
animlogo.doc
<<component>>
animator.java
<<component>>
animator.doc
This example shows a typical dependency among few components:
html file with embedded Java applet and software documentation files.

NOTE! Component element color in *Workstations* diagram remains the same without any changes because only *Java Files* diagram was selected in the **Select Diagrams** dialog box to apply changed colors.

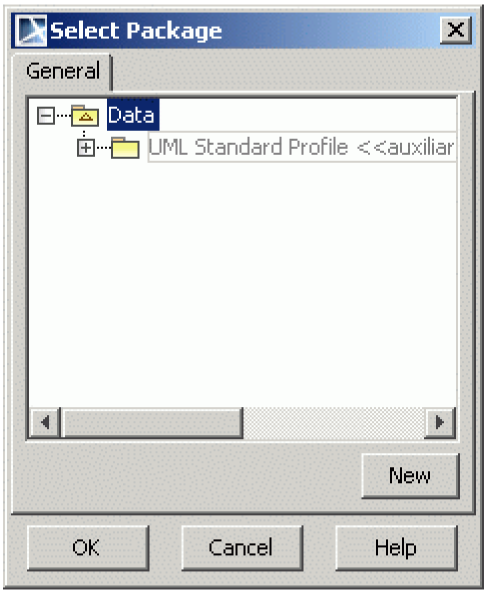
APPLYING IMAGES TO STEREOTYPES

STEP#1 Organize Stereotypes in the Browser, Model Extensions Tree

1. In the Browser, **Model Extensions Tree** tab, there are all project stereotypes listed. Use buttons to group them by profile or metaclass. :



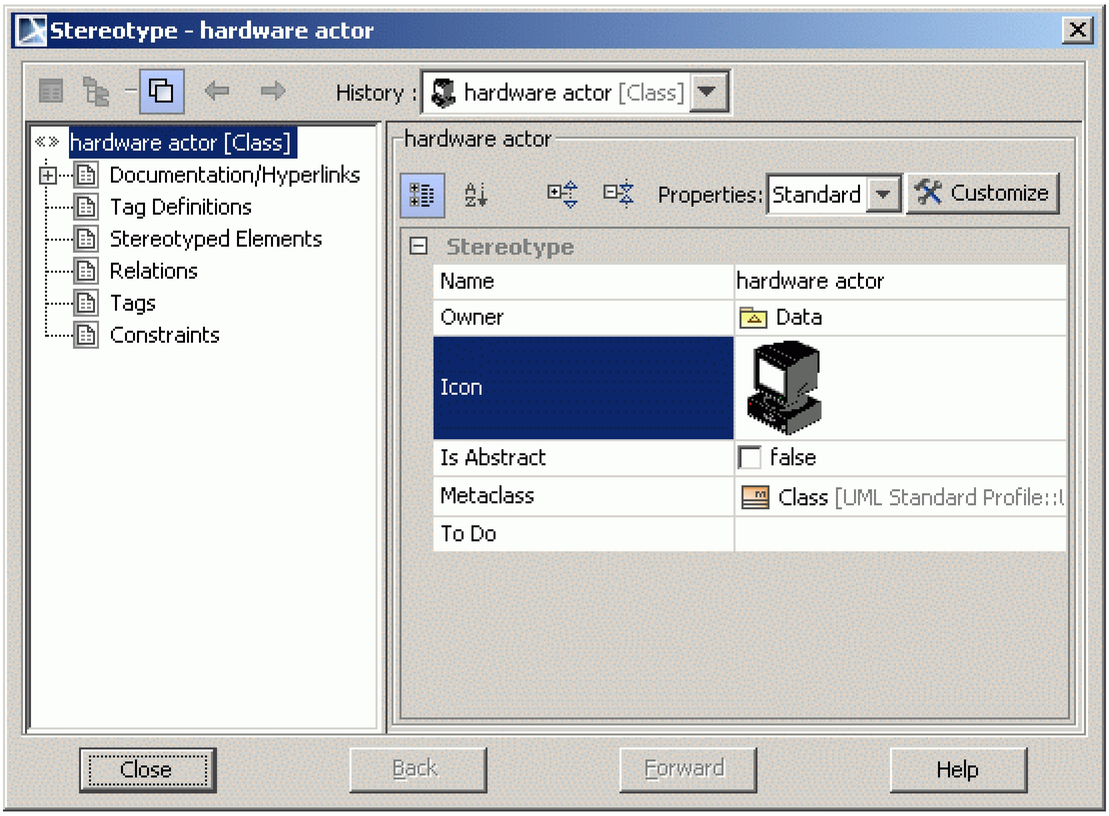
2. You may choose an existing stereotype from the tree or add a new one from the metaclass shortcut menu, by choosing **New** and then **Stereotype.** The **Select Package** dialog box opens:



3. Select package, where newly created stereotype will be saved and click **OK**. Type the name of the stereotype in the Browser.
4. Press **Enter**, double-click or from the stereotype shortcut menu, choose **Specification**. The **Stereotype Specification** dialog box opens.

STEP#3 Choose an icon for the stereotype

1. Click the **"..."** button near the **Icon** field. The **Open** dialog box appears.
2. Select the image to be attached to the stereotype, and click **Open**. An icon appears in the **Icon** field:



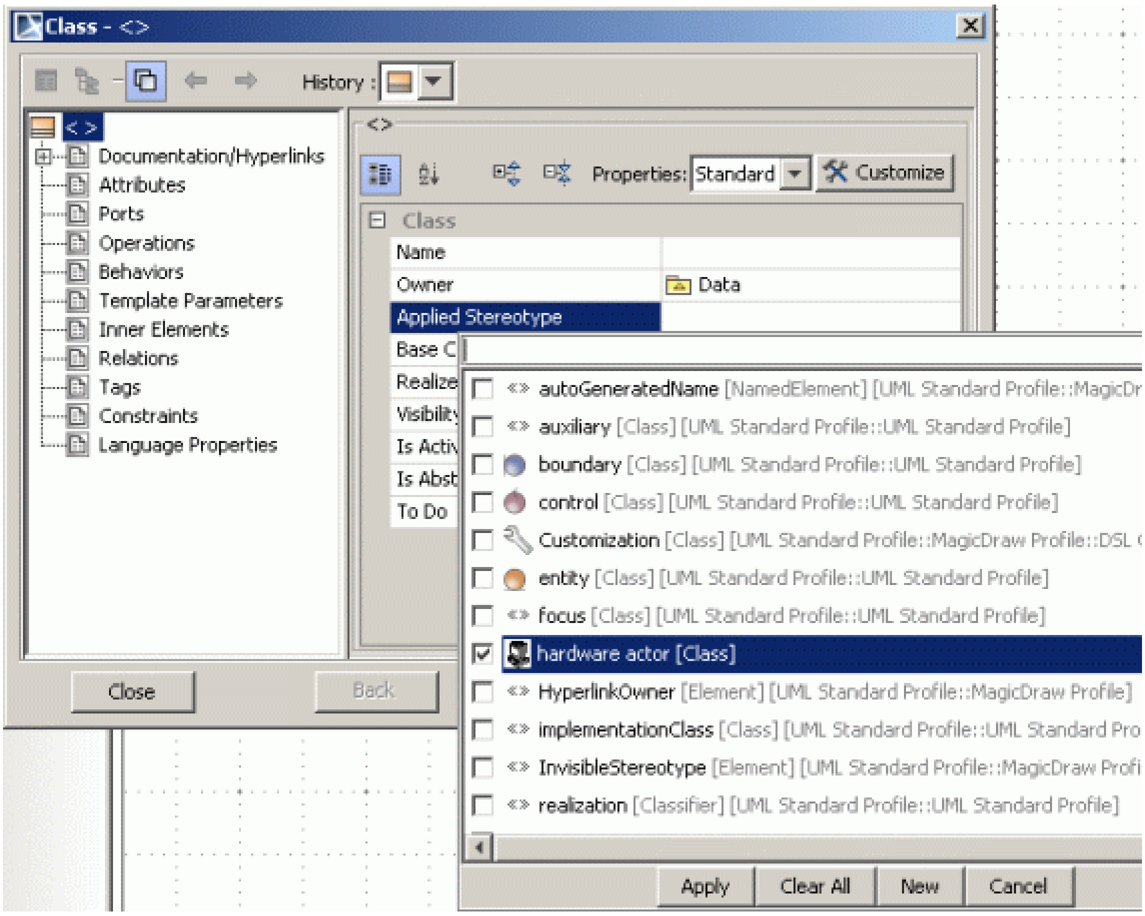
Name	hardware actor
Owner	Data
Icon	
Is Abstract	□ false
Metaclass	Class [UML Standard Profile::U
To Do	

NOTE: GIF, JPG, JPEG, SVG, PNG, and MDICO files are attachable.

3. In two opened dialog boxes click **Close** and **OK**.

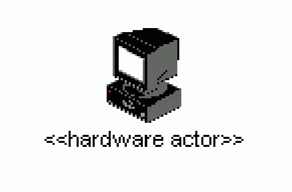
STEP#4 Applied Stereotype Property

1. Right-click the class shape and from the shortcut menu, choose **Specification**. The **Class Specification** dialog box opens.
2. Choose the **Applied Stereotype** property and click the **“...”** button to apply a newly created stereotype from the list. Click **Apply**. Click **Close**. The icon is added on the class element symbol

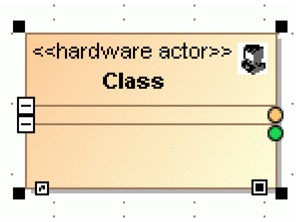

Class - <>
History :
<>
Documentation/Hyperlinks
Attributes
Ports
Operations
Behaviors
Template Parameters
Inner Elements
Relations
Tags
Constraints
Language Properties
Properties: Standard
Customize
Class
Name
Owner
Data
Applied Stereotype
Base C
Realize
Visibility
Is Activ
Is Abst
To Do
Close
Back
□ autoGeneratedName [NamedElement] [UML Standard Profile::MagicDr
□ auxiliary [Class] [UML Standard Profile::UML Standard Profile]
□ boundary [Class] [UML Standard Profile::UML Standard Profile]
□ control [Class] [UML Standard Profile::UML Standard Profile]
□ Customization [Class] [UML Standard Profile::MagicDraw Profile::DSL
□ entity [Class] [UML Standard Profile::UML Standard Profile]
□ focus [Class] [UML Standard Profile::UML Standard Profile]
☑ hardware actor [Class]
□ HyperlinkOwner [Element] [UML Standard Profile::MagicDraw Profile]
□ implementationClass [Class] [UML Standard Profile::UML Standard Pro
□ InvisibleStereotype [Element] [UML Standard Profile::MagicDraw Profi
□ realization [Classifier] [UML Standard Profile::UML Standard Profile]
Apply
Clear All
New
Cancel

STEP#5 Suppress attributes and operations

1. Select a class and from its shortcut menu, choose **Presentation Options**.
2. Select the **Suppress Attributes** check box.
3. Go again to the **Presentation Options** menu and select the **Suppress Operations** check box.
4. A new notation for your element appears on a diagram:



TIP You can suppress attributes and operations using a smart manipulation feature. Select a class and click on the buttons with ‘minus’ sign.


<<hardware actor>>
Class

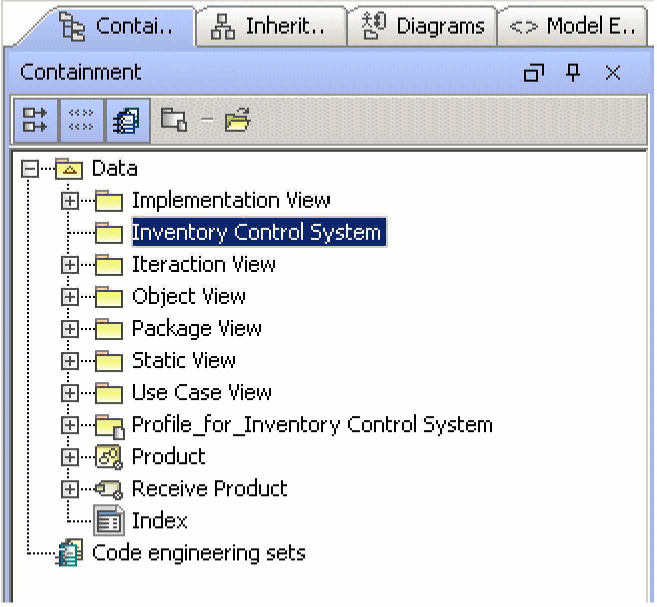
DATA PARTITIONING

NOTE This functionality is available in Standard, Professional, Architect, and Enterprise editions only.

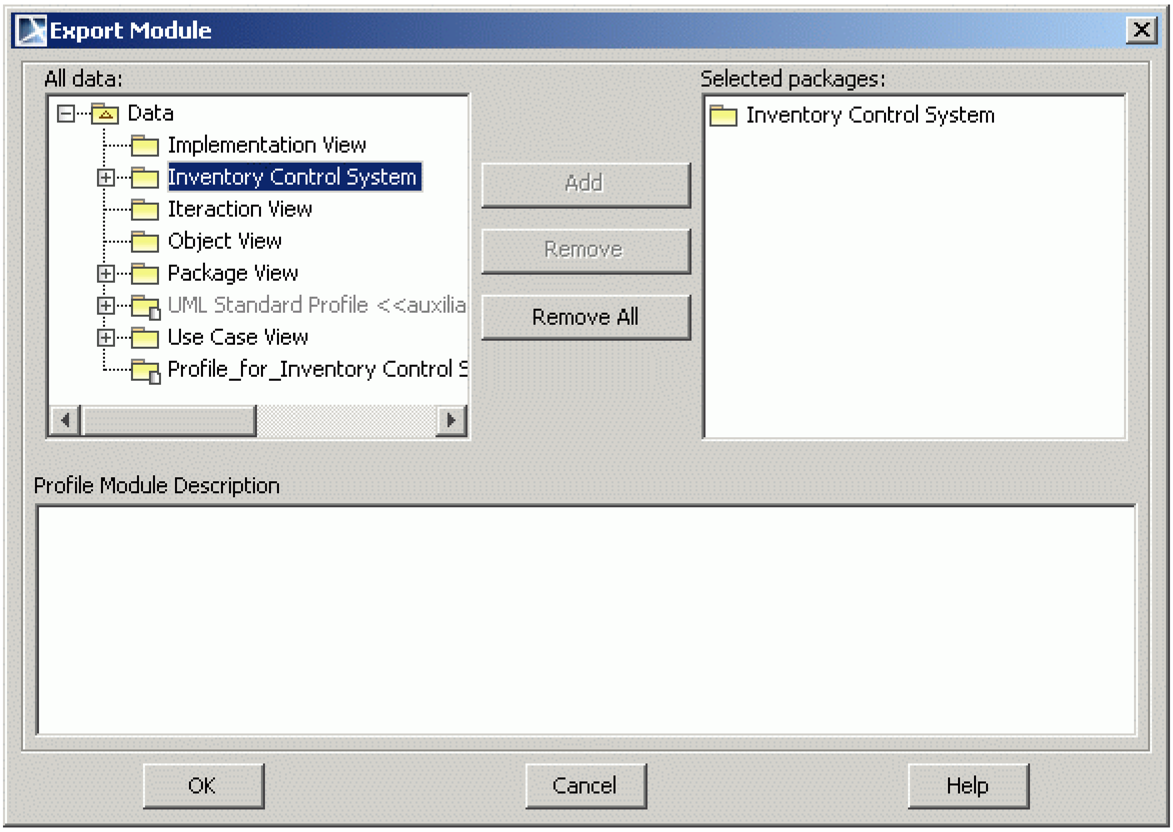
For starting work with a data partitioning, from the MagicDraw installation directory, **samples** folder, **case studies** subfolder, open the **Inventory Control System.xml.zip** project.

STEP #1 Export a new Module

1. In the Browser Tree, from the **Data** package shortcut menu, choose **New Element** and then **Package**. Name this package directly in the Browser as *Inventory Control System.*



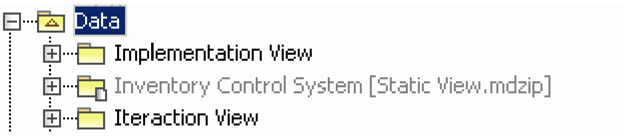
2. Select the *Static View* package and drag it to the newly created package. A class diagram with all contained elements now is an inner element of the *Inventory Control System* package.
3. From the *Inventory Control System* package shortcut menu, choose **Modules**, and then choose **Export Module**. The **Export Module** dialog box appears.



4. The **Selected packages** list shows, which package will be exported as a module. Click **OK**.

NOTE If you want to check for dependencies and module you are exporting depends on external project elements, the **Package Dependencies** dialog box appears. Using this dialog box, solve errors. Then you will be able to export module.

5. The **Save** dialog box appears. Select the destination directory, where you want to save the project module, type the file name *Static View* and click **Save**. The name of the module appears in the Browser, near the package name.

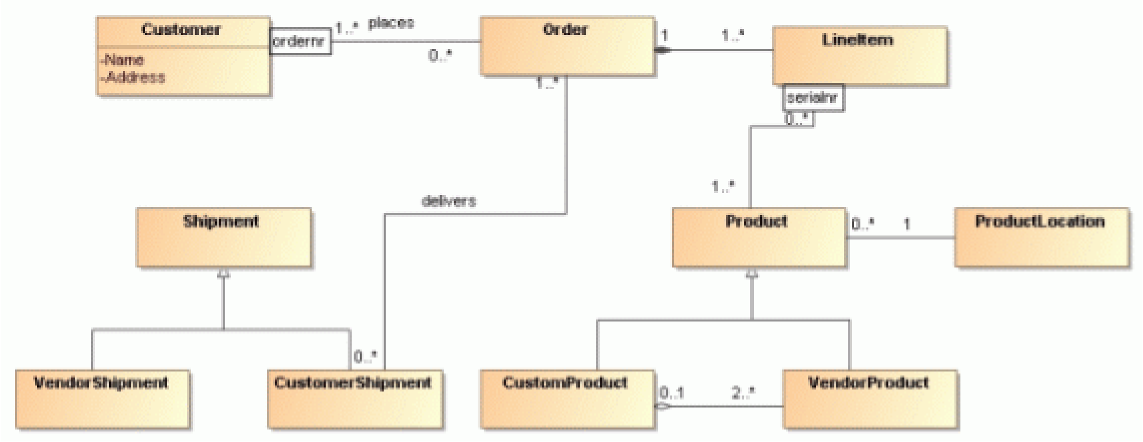


NOTE The exported module is not editable after exportation. If you want to make some changes, from the module shortcut menu, choose **Modules**, and then choose **Import Module**. The module will be merged with a project model.

STEP #2 Open module as a new project

1. In the Browser Tree, from the *Inventory Control System* package shortcut menu, choose **Modules**, and then choose **Open Module As Project**. A new project is opened.
2. In the *Inventory Control System* package, the *Static View* subpackage, select the *Top Level class diagram* and open it from the diagrams shortcut menu choosing **Open**. The Diagram pane with element symbols appears.
3. Add two attributes to the class *Customer*. Select this class in the Diagram pane. From the class shortcut menu, select the **Presentation Options** command and clear the **Suppress Attributes**

check box. In the Diagram pane, press CTRL+ALT+A. A new attribute is added to the class. Type the name for the attribute *Name*. Add one more attribute, name it *Address*.



4. Save the changes, made to this project.

STEP #3 Reload the module

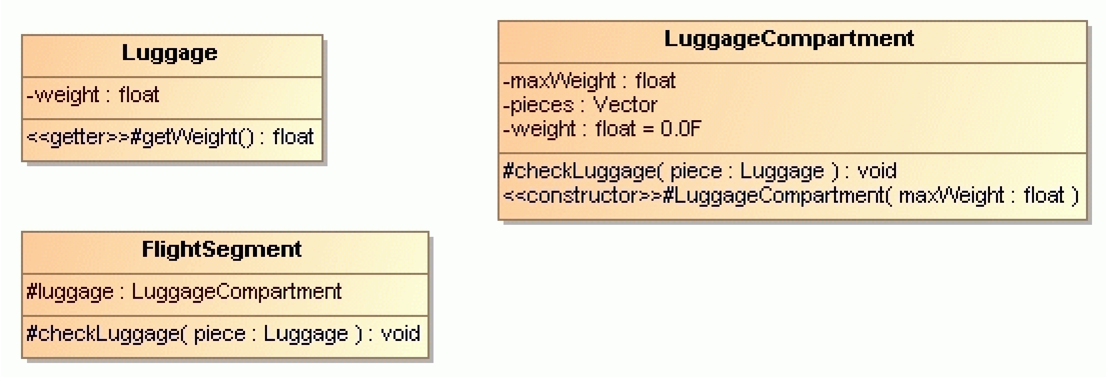
1. From the **File** main menu, choose **Opened Projects**, and then choose *Inventory Control System.mdzip.* The previous project will be opened.
2. In the Browser, select the *Inventory Control System* module. From its shortcut menu, choose **Modules**, and then choose **Reload Module**.
3. To see changes were applied to the module, open the *Top Level class diagram*. The class *Customer* has two attributes.

PERFORMING ROUND TRIP

NOTE Code Engineering is available in Professional, Architect and Enterprise editions only.

Three classes, presenting the system for controlling the luggage storage in an aircraft will be used in this tutorial:

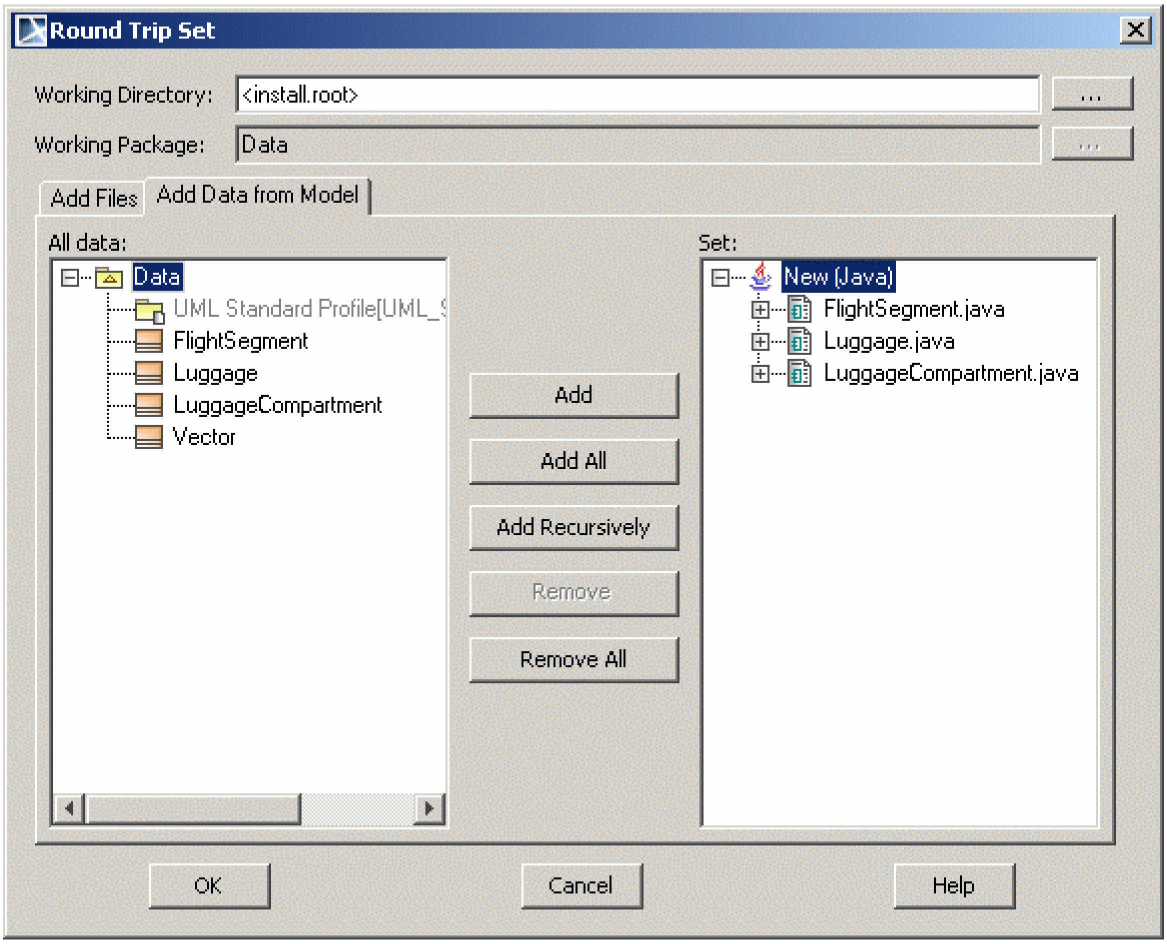
- **Luggage** – represents a piece of luggage;
- **LuggageCompartment** – represents the luggage compartment of an aircraft during a flight;
- **FlightSegment** – represents a flight segment.


Luggage
-weight : float
<<getter>>#getWeight() : float
LuggageCompartment
-maxWeight : float
-pieces : Vector
-weight : float = 0.0F
#checkLuggage(piece : Luggage) : void
<<constructor>>#LuggageCompartment(maxWeight : float)
FlightSegment
#luggage : LuggageCompartment
#checkLuggage(piece : Luggage) : void

STEP#1 Add elements to the newly created code engineering set

1. In the **Browser** tree, from the **Code engineering sets** shortcut menu, choose **New**, and then **Java.** Type the name of a new set in Browser. A new java set is created.
2. From this newly created set shortcut menu, choose **Edit**. The **Round Trip Set** dialog box appears.

3. Open the **Add Data from Model** tab and from the **All Data** list to the **Set** list, add the selected classes.



4. Click **OK**.

STEP#2 Generate code

1. From the code engineering set shortcut menu, choose **Generate**. The **Code Generation Options** dialog box appears.
2. Define options of the generation and click **OK**. (For more detailed information about how to generate code, see Tutorial “Code Generation and Reverse”).

The java code is generated:

```
/**
 * @(#) Luggage.java
 */
public class Luggage
{
    private float weight;
    /**
     * Return the weight of this piece of luggage in kg.
     */
    protected float getWeight( )
    {
          return 0;
    }
}


/**
* @(#) LuggageCompartment.java
```

```
*/
public class LuggageCompartment
{
     private float maxWeight;
     private Vector pieces;
     private float weight = 0.0F;
     /**
      * Check a piece of luggage
      */
     protected void checkLuggage( Luggage piece )
     {
     }
     /**
      * Constructor
      */
     protected LuggageCompartment( float maxWeight )
     {
     }
}

/**
* @(#) FlightSegment.java
*/
public class FlightSegment
{
     protected LuggageCompartment luggage;
     /**
      * Check a piece of luggage
      */
     protected void checkLuggage( Luggage piece )
     {
     }
}
```

STEP#3 Add a new *LuggageException* class to the model

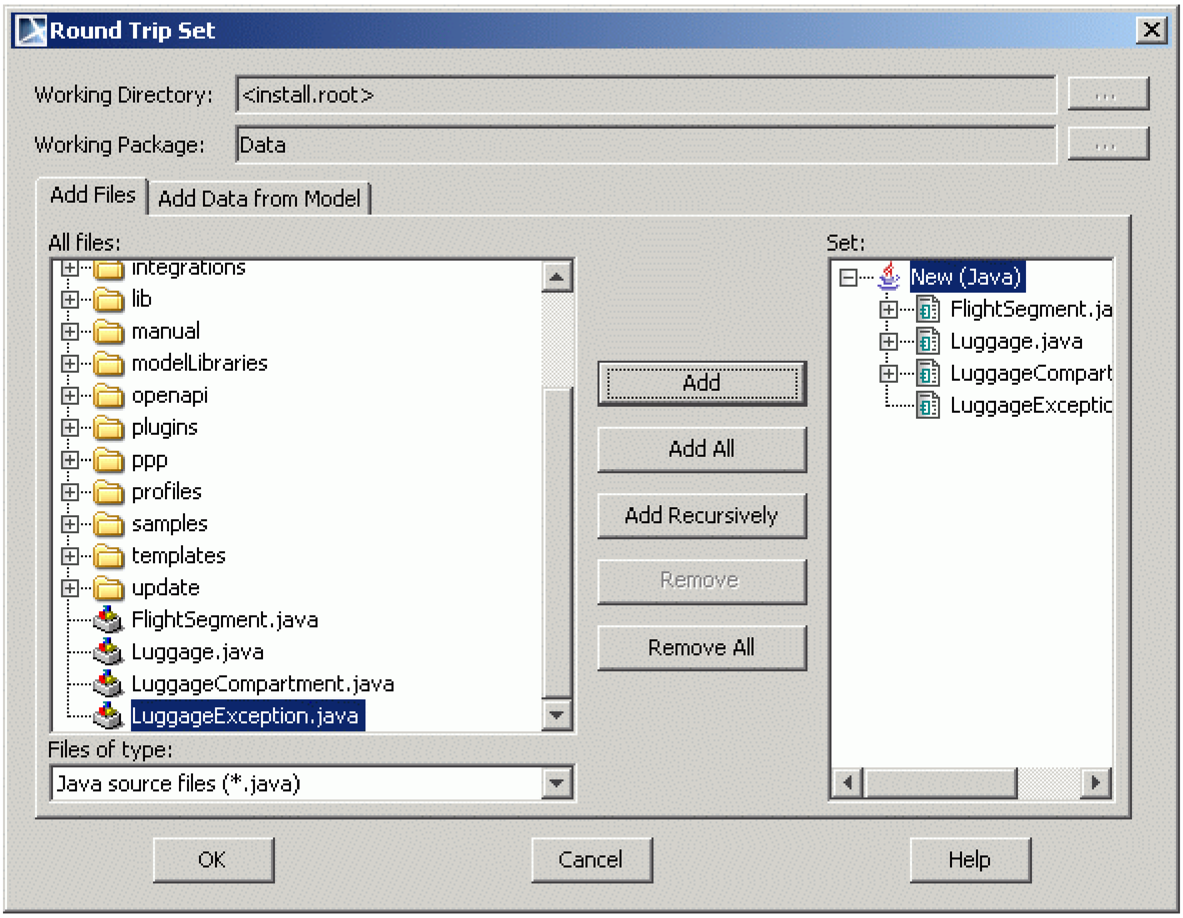
When coding according these constraints, it is learned that exceptions need to be provided in case luggage checking fails. To account for this, a new class called *LuggageException* is introduced:

1. Create a new java code file and write the source code for a new class *LuggageException* addition:

```
/**
* An instance of this is thrown when a requested operation on luggage
* may not be performed.
*/
public class LuggageException extends Exception {
/**
* Constructor
*/
public LuggageException(String msg) { super(msg); }
}
```

2. In the MagicDraw, select the created **New (Java)** set and from its shortcut menu, choose **Edit.** The **Round Trip Set** dialog box appears.

3. In the **Add Files** tab, select the created *LuggageException.java* code file and add this file to the **Set** files list.



Round Trip Set

Working Directory: <install.root>

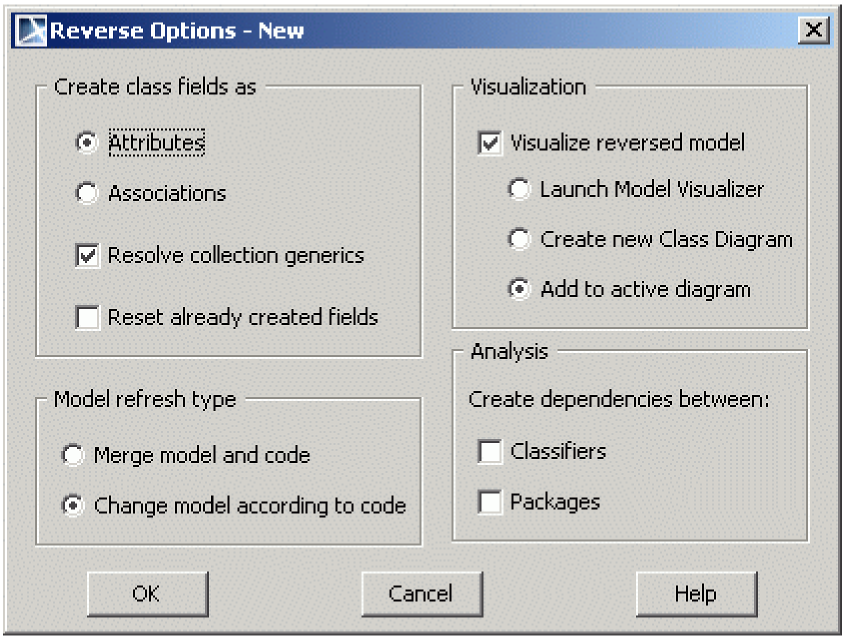
Working Package: Data

Files of type: Java source files (*.java)

4. Click **OK**. The code file is added to the set.

STEP#4 Create class element in the project using reverse

1. From the code engineering set shortcut menu choose **Reverse**. The **Reverse Options** dialog appears:



Reverse Options - New

Create class fields as
- ● Attributes
- ○ Associations
- ☑ Resolve collection generics
- ☐ Reset already created fields

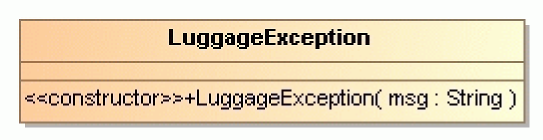
Model refresh type
- ○ Merge model and code
- ● Change model according to code

Visualization
- ☑ Visualize reversed model
- ○ Launch Model Visualizer
- ○ Create new Class Diagram
- ● Add to active diagram

Analysis

Create dependencies between:
- ☐ Classifiers
- ☐ Packages

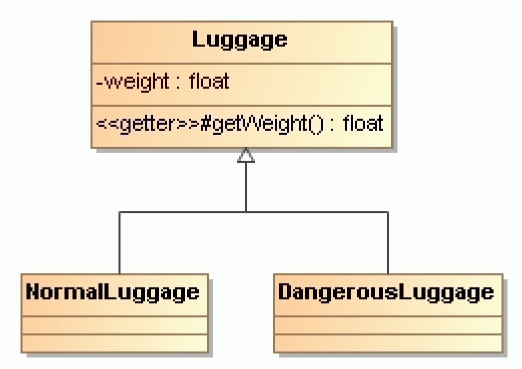
2. Define options of the reverse and click **OK**. A new class element is added to the project and class symbol appears on the Diagram pane.



STEP#5 Separate luggage into two types

Next, a new requirement for the software is introduced. Luggage must be separated into two types: normal and dangerous.

1. According to these new requirements, create two new classes, *DangerousLuggage* and *NormalLuggage* (subclasses of *Luggage*) in the model. Link them with *Luggage* class by Generalization relationship.



2. Generate the code to the *Luggage* class element from the set. Open the generated code file. The additional lines are added according to the new created subclasses.

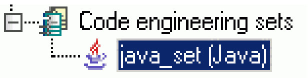
```
/**
 * @(#) Luggage.java
 */
public class Luggage
{
     private float weight;
     /**
      * Return the weight of this piece of luggage in kg.
      */
     protected float getWeight( )
     {
            return 0;
     }
     public class NormalLuggage extends Luggage
     {
     }
     public class DangerousLuggage extends Luggage
     {
     }
}
```

CODE GENERATION AND REVERSE

NOTE Code Engineering is available in Professional, Architect and Enterprise editions only.

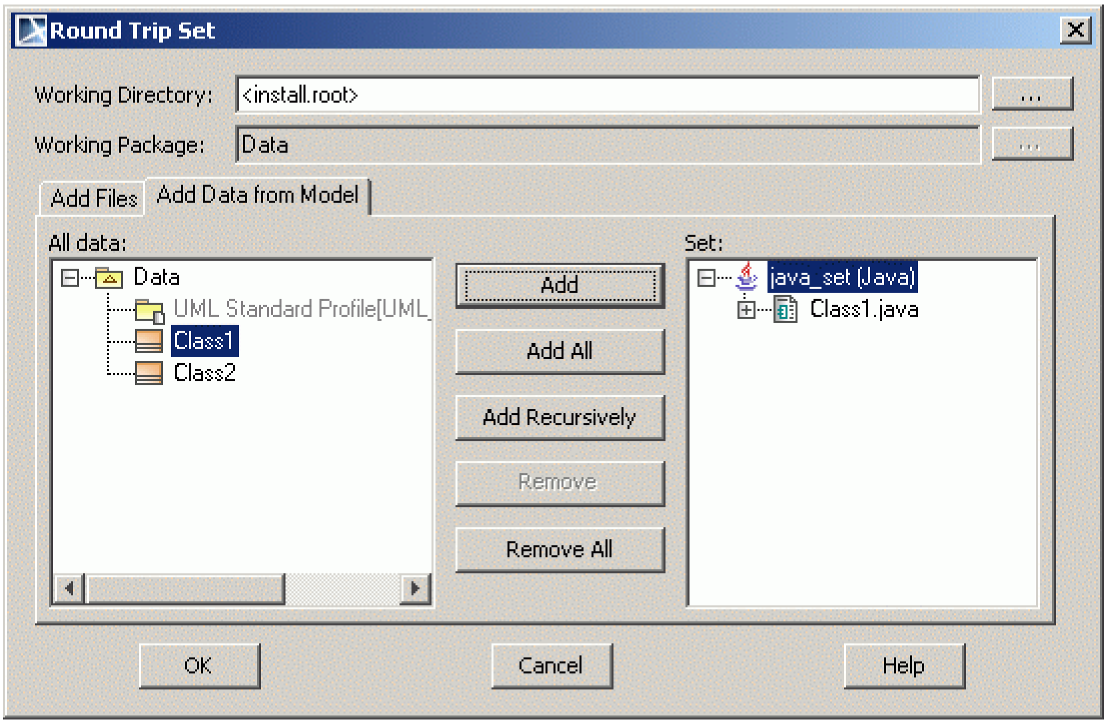
STEP #1 Create a new code engineering set

1. Right-click the **Code Engineering Sets** in the **Browser** tree. From the shortcut menu choose **New** and then language.
2. Type the name for set directly in the Browser. A new java set is created..



STEP #2 Add data you wish to generate

1. From the created code engineering set shortcut menu, choose **Edit**. The **Message** dialog box appears. Click **OK**.
2. Open the **Add Data from Model** tab in the **Round Trip Set** dialog box. From the **All Data** list to the **Set** list, add classes, interfaces, packages, or components (we have two classes already created in the model). Click **OK**.


Round Trip Set

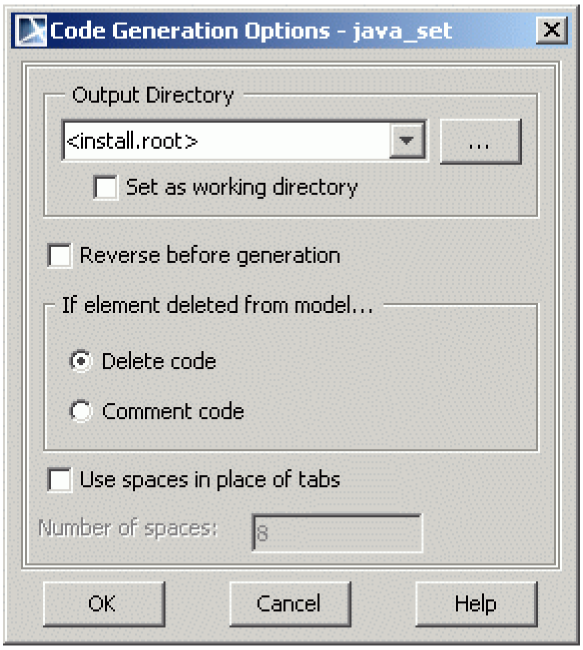
Working Directory: <install.root>

Working Package: Data

TIP! To add data for generation, you can drag–and–drop elements to the created set in the Browser tree.

STEP #3 Generate code

1. From the code engineering set shortcut menu, choose **Generate**. The **Code Generation Options** dialog box appears.



Code Generation Options - java_set

Output Directory

<install.root>

☐ Set as working directory

☐ Reverse before generation

If element deleted from model...

● Delete code

○ Comment code

☐ Use spaces in place of tabs

Number of spaces: 8

2. Define options of the generation:
    - If the classes for which you wish to generate code were not reversed, neither the **Reverse before generation** option, nor the **If element deleted from model** options, will influence the generated code.
    - If classes are reversed and you click the **Reverse before generation** check box, the file will be reversed once more before generation.
    - If there are any deleted elements in the model since the last reverse, the **If element deleted from model** options group box determine the code generation behavior.
    - To use spaces instead of tabs in the code file, click the **Use spaces in place of tabs** check box.
3. After you set these options, click **OK**.

STEP #4 Edit generated source

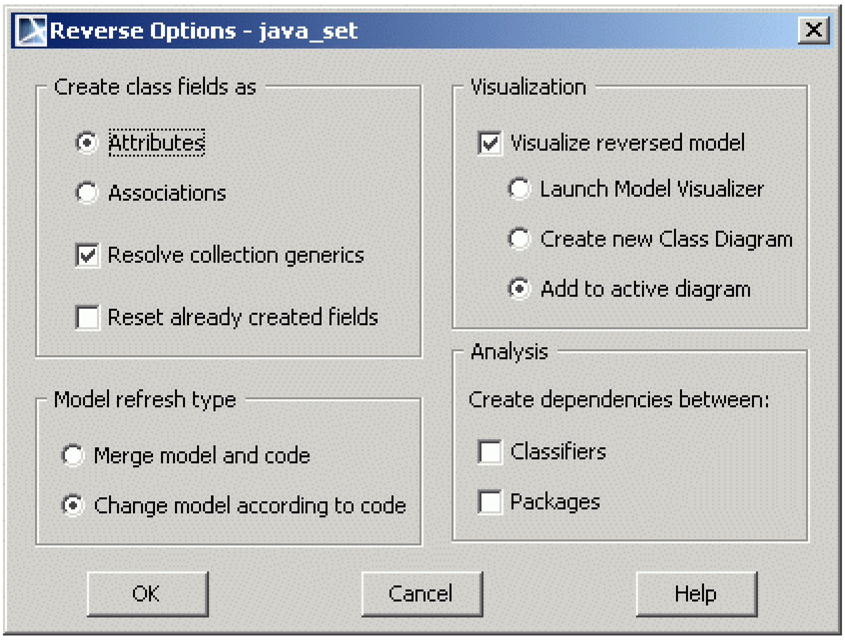
1. From the code engineering set shortcut menu, choose **Edit Source**.

NOTE: In the **Options** main menu, choose **Environment**, select **Launchers** group and click the "..." button to set a default tool for editing source code text.

2. The generated source will be opened for editing. Edit source and save changes.

STEP #5 Reverse modified source code

1. From the modified code engineering set shortcut menu, choose **Reverse**. The **Reverse Options** dialog appears.



Reverse Options - java_set

Create class fields as
- ● Attributes
- ○ Associations
- ☑ Resolve collection generics
- □ Reset already created fields

Model refresh type
- ○ Merge model and code
- ● Change model according to code

Visualization
- ☑ Visualize reversed model
- ○ Launch Model Visualizer
- ○ Create new Class Diagram
- ● Add to active diagram

Analysis

Create dependencies between:
- □ Classifiers
- □ Packages

2. Define options of the reverse:
   - To create attributes instead of associations, choose the **Attributes** option button. Class may have a collection of other classes and use Java generics (e.g. List<String>). If the **Resolve collection generics** check box is selected, types of collection will be resolved (property type will be not collection, but real type). Select the ceck box to reset an already created fields.
   - Select the **Visualize reversed model** check box and choose how the reversed data will be applied. The possible choices are: create a new diagram by launching **Model Visualizer** and starting **Diagram Wizards**, just create a new class diagram, or place data in an active class diagram.
   - To merge all the differences between the elements in the model and the ones in the file, click the **Merge model and code** option button. The model elements will be updated by code. Elements that do not exist in the code will not be removed from the model. To ensure that the elements in the model will be exactly the same as in the source file after the reverse, click the **Change model according to code** option button.
   - To create dependencies between classifiers and/or packages in model, select the appropriate check boxes.
3. Click **OK**.

NOTE! If you have only a source code and want to create a model, from the newly created code engineering set shortcut menu, choose **Edit.** Add files you wish to reverse from your hard disk to the set, in the **Round Trip Set** dialog box, the **Add Files** tab.

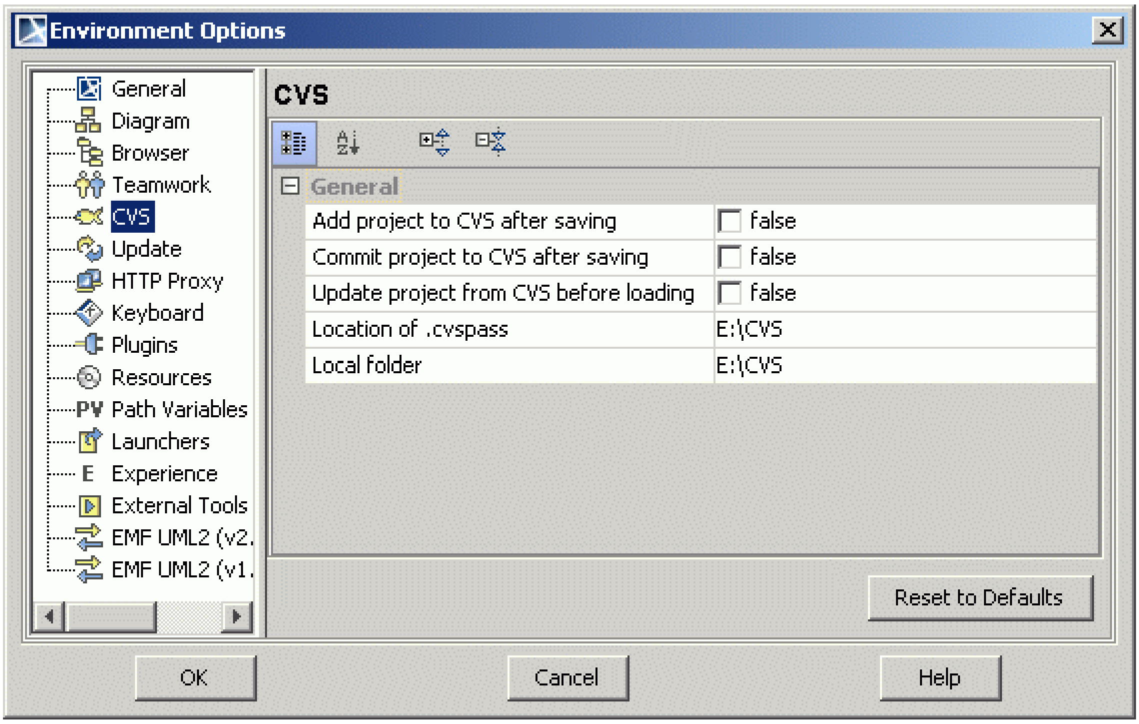
TIP! You may reverse the desired files using the **Quick Reverse** option: from the **Tools** menu, choose **Quick Reverse**, select a language and select a files you want to reverse.

INTEGRATION WITH CVS

NOTE Integration with CVS is available in Professional, Architect and Enterprise editions only.

STEP #1 Define main CVS options

1. From the **Options** main menu, choose **Environment**. The **Environment Options** dialog box appears.
2. Choose the **CVS** pane.



General	
Add project to CVS after saving	□ false
Commit project to CVS after saving	□ false
Update project from CVS before loading	□ false
Location of .cvspass	E:\CVS
Local folder	E:\CVS

3. Define options for CVS:

- If you want to add project to the CVS server every time after saving, select the **Add project to CVS after saving** check box.
- If you want to commit project to the CVS server every time after saving, select the **Commit project to CVS after saving** check box.
- If you want to update project when there is a new version on the server, select the **Update project from CVS before loading** check box.

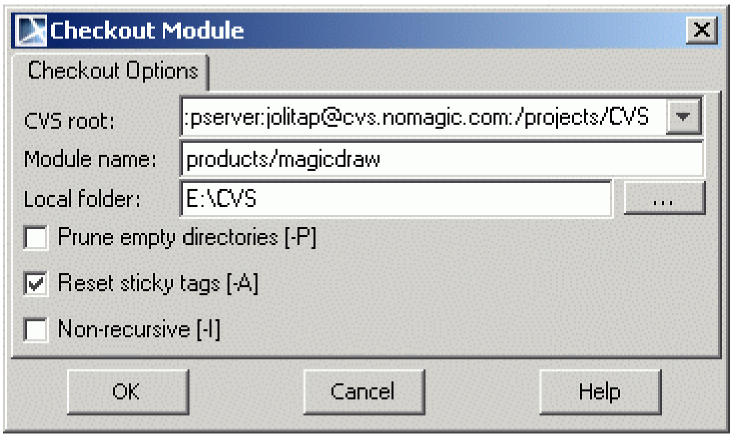
4. Specify the path where the passwords storing file **.cvspass** is located and path of local folder where the module will be saved on checkout action.

NOTE Grouped directories, that contain subfolders with the together related files are called modules.

5. Click **OK.**

STEP #2 Check out from scratch a new module on your disk

1. From the **Tools** menu, choose **CVS**, and then choose **Checkout Module.** The **Checkout Module** dialog box appears.



Checkout Module

Checkout Options

CVS root: :pserver:jolitap@cvs.nomagic.com:/projects/CVS

Module name: products/magicdraw

Local folder: E:\CVS

□ Prune empty directories [-P]

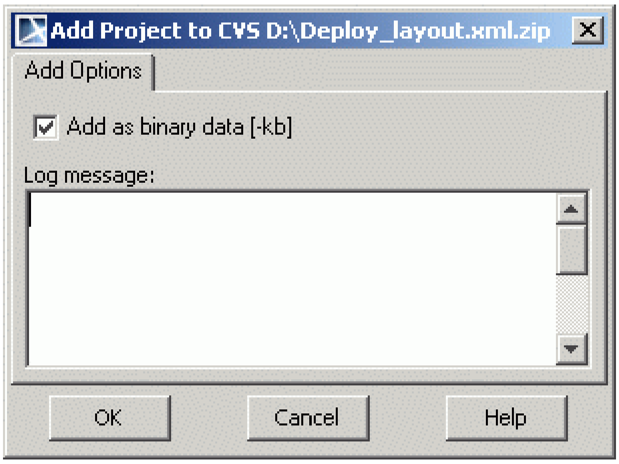
☑ Reset sticky tags [-A]

□ Non-recursive [-l]

2. In the **CVS Root** field, enter the path of the CVS repository, which stores a complete copy of all the files and directories that are under version control.
3. In the **Module name** field, enter the path where the module is stored.
4. In the **Local folder** field enter the path of the local folder where the module will be saved on checkout action.
   - You may select the **Prune empty directories** check box, if you want automatically remove empty folders when you update a module.
   - For checking out only the last project version, select the **Reset sticky tags** check box.
   - If you don’t want to check out the subdirectories, select the **Non-recursive** check box.
5. Click **OK**.

STEP #3 Add project to CVS

1. Create a new MagicDraw project.
2. Save it in already checked out directory (how to check out CVS directory, see CVS help.)
3. From the **Tools** menu, choose **CVS**, and then choose the **Add Project to CVS** command. The **Add Project to CVS** dialog box appears.
4. **NOTE:** If the **Add Project to CVS after Saving** command in the **Environment Options** dialog box, **CVS** pane is selected, the **Add Project to CVS** dialog box appears every time when the new to CVS project is being saved.



Add Project to CVS D:\Deploy_layout.xml.zip

Add Options

☑ Add as binary data [-kb]

Log message:

- If the project is saved as XML.ZIP format, select the **Add as binary data [-kb]** check box.

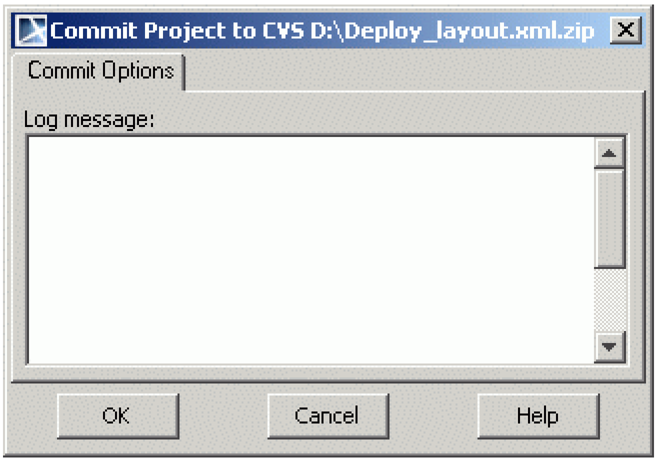
5. If needed, type the **Log message**.
6. Click **OK**.

STEP #4 Commit project to CVS after making changes

1. From the **Tools** menu, choose **CVS**, and then choose **Commit Project to CVS**. The **Commit Project to CVS** dialog box appears.

NOTE:	Project is committed to the CVS server every time after saving it, if the option **Commit Project to CVS After Saving** is selected in the **Environment Options** dialog box, **CVS** pane

.

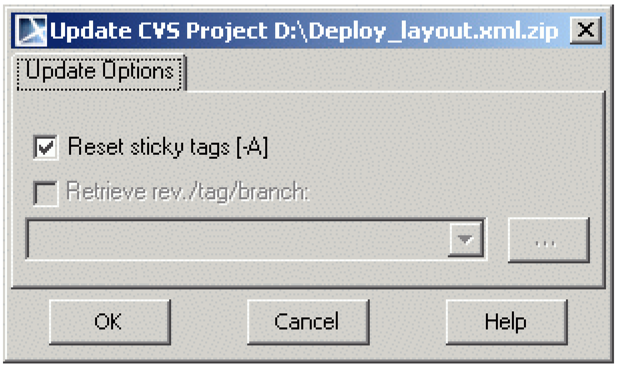


Commit Project to CVS D:\Deploy_layout.xml.zip

2. In the **Log message** field, type the message about the project that can be important for other users.
3. Click **OK**.

STEP #5 Update CVS project

1. From the **Tools** menu, choose **CVS**, and then choose **Update CVS Project**. The **Update CVS Project** dialog box appears.



Update CVS Project D:\Deploy_layout.xml.zip

☑ Reset sticky tags [-A]

□ Retrieve rev./tag/branch:

- If the **Reset sticky tags** check box is selected, the last version of the project that is on the server will be updated. If no check box is selected, you will be informed that project is already opened but you can reload it and loose changes.
- Type the tag or version number you want to update to the **Retrieve rev./tag/branch** field (it becomes enabled when the **Reset sticky tags** check box is cleared). You may click the '…' button and in the **Revision** dialog box choose the desirable version.

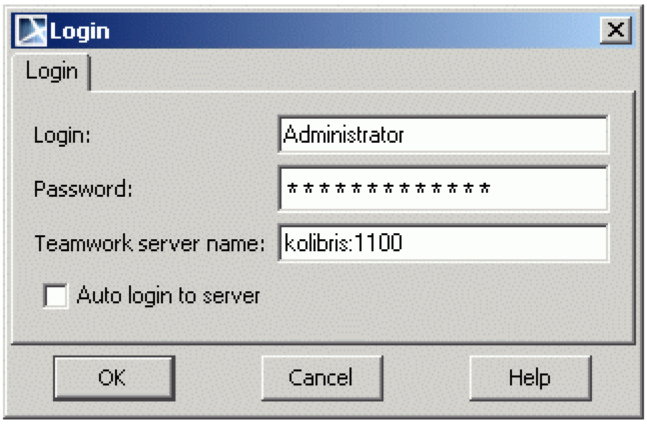
2. Click **OK**.

USING TEAMWORK SERVER

Getting Started with Teamwork Server

STEP #1 login to the teamwork server

1. From the **Teamwork** main menu, choose **Login**. The **Login** dialog box appears.



Login: Administrator

Password: *************

Teamwork server name: kolibris:1100

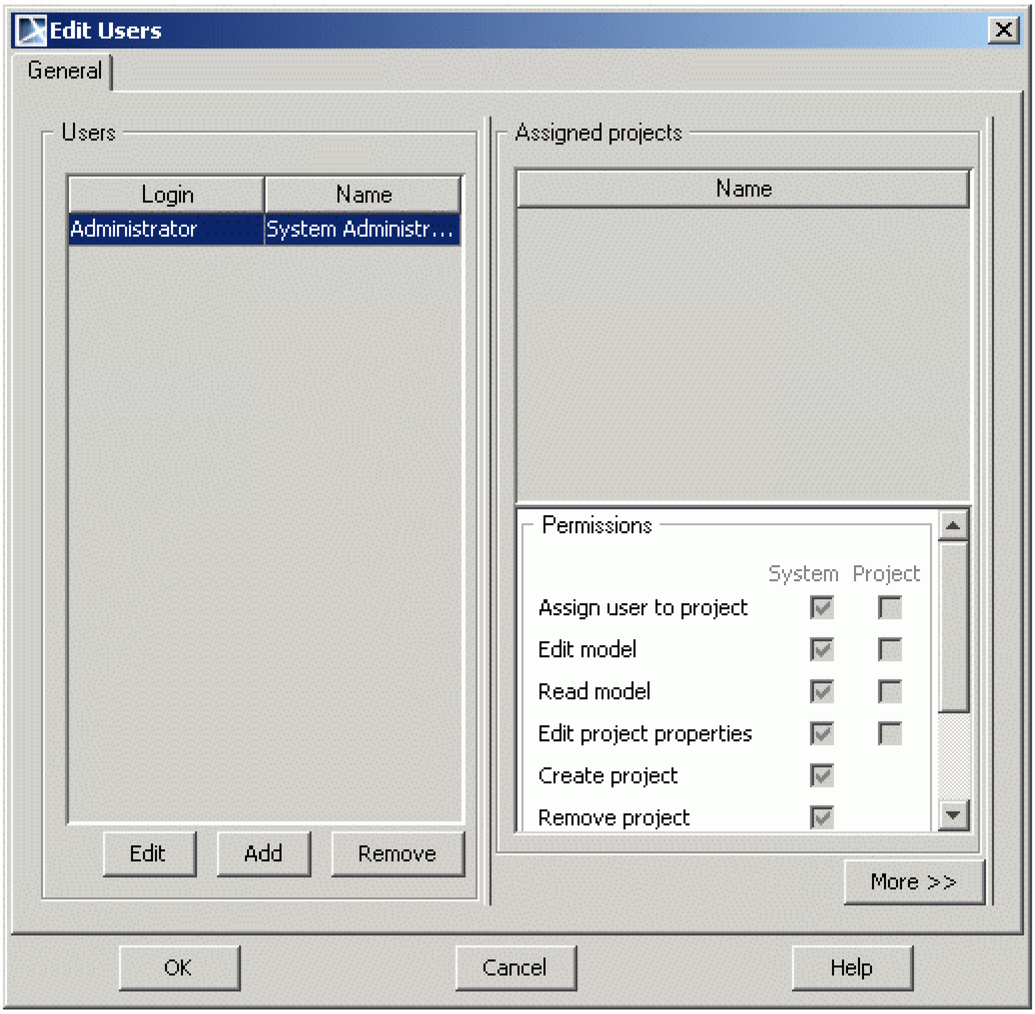
□ Auto login to server

2. To login to the server as administrator, in the **Login** and **Password** fields, type “Administrator”. In the **Teamwork Server Name** text box, enter the server name and port.
3. If you want every time when starting MagicDraw to connect to the server, select the **Auto Login to Server** check box.
4. Click **OK**. On the status bar the note ”Logged in as: Administrator” appears. The Administrator has administrator’s permissions (all available permissions) and is allowed to create new users.

Logged in as: Administrator

STEP #2 create teamwork server users

1. From the **Teamwork** main menu, choose **Users.** The **Edit Users** dialog box appears**.**

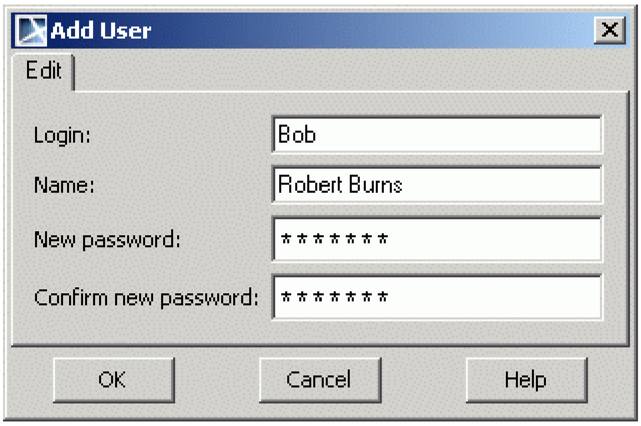


Login	Name
Administrator	System Administr...

Permissions

	System	Project
Assign user to project	☑	☐
Edit model	☑	☐
Read model	☑	☐
Edit project properties	☑	☐
Create project	☑	
Remove project	☑	

2. To add a new user, click the **Add** button. The **Edit User** dialog box appears.

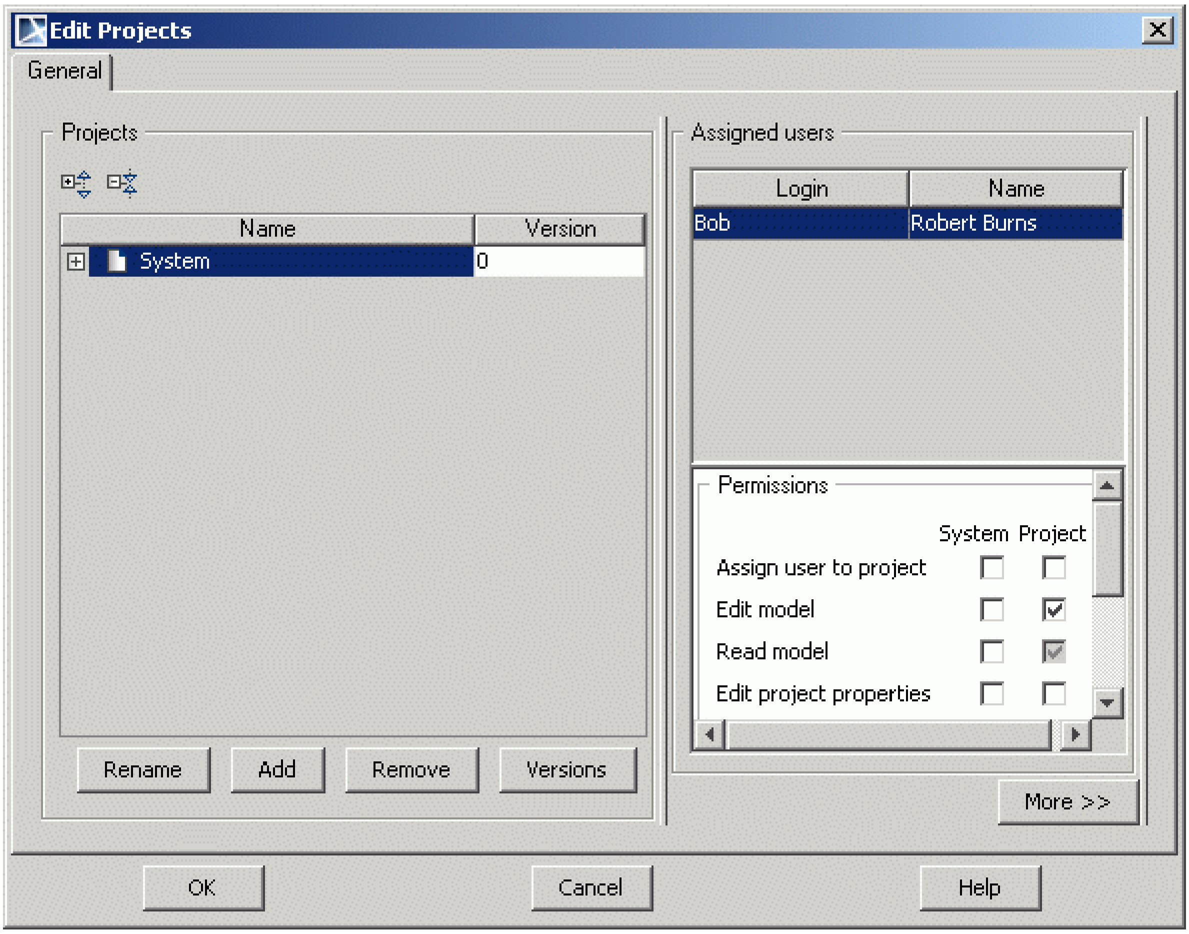


Login:	Bob
Name:	Robert Burns
New password:	*******
Confirm new password:	*******

3. Enter the login, name, and password for the user. Click **OK**. A new user is created.
4. In the **Edit Users** dialog box, **Permissions** list, set specific permissions for the user by selecting corresponding check boxes.
5. The **More>>** button allows to set permissions for the users on particular projects. If there are teamwork projects available, you can set permissions for the users on these projects.
6. When all users are added and permissions are set, click **Close**.

STEP #3 create teamwork project

1. If there are no teamwork projects created or you need a new teamwork project, from the **Teamwork** main menu, select **Projects**. The **Edit Projects** dialog box appears.

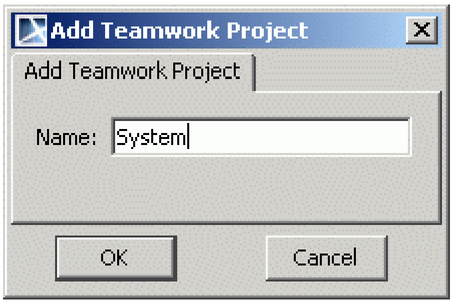


Name	Version
System	0

Login	Name
Bob	Robert Burns

	System	Project
Assign user to project	□	□
Edit model	□	☑
Read model	□	☑
Edit project properties	□	□

2. Select from the existing teamwork projects or add a new project using the **Add** button. When adding a new project, the **Project Name** dialog box appears. Enter the name for a new project or leave the default one. Click **OK**.



Name: System

3. In the **Permissions** list, set project permissions for the users. Click **Close**.

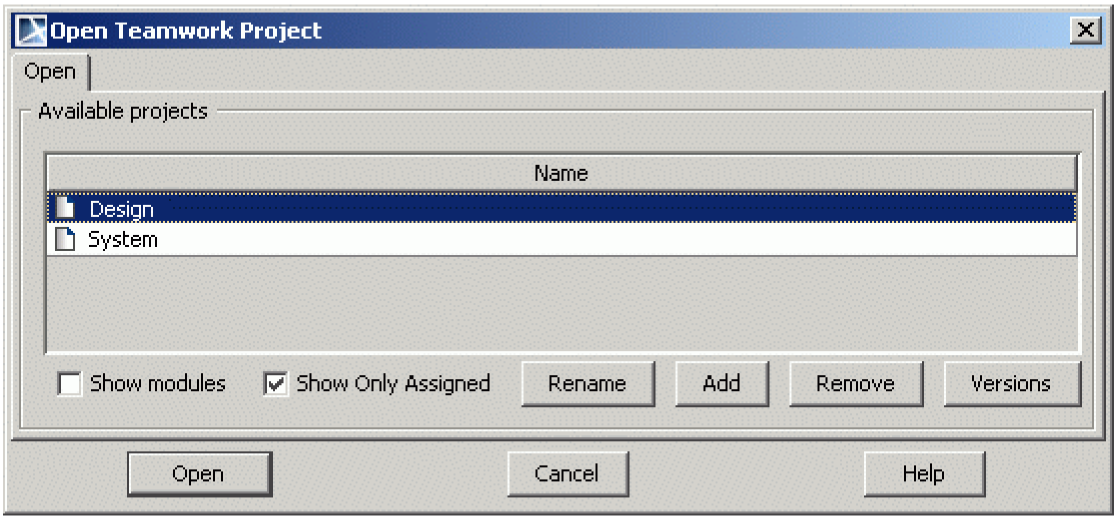
Editing Teamwork Projects

STEP #1 Login to the teamwork server

1. From the **Teamwork** main menu, choose **Login**. The **Login** dialog box appears.
2. Enter the user login, password, and teamwork server name. Click **OK**.

STEP #2 Open teamwork project

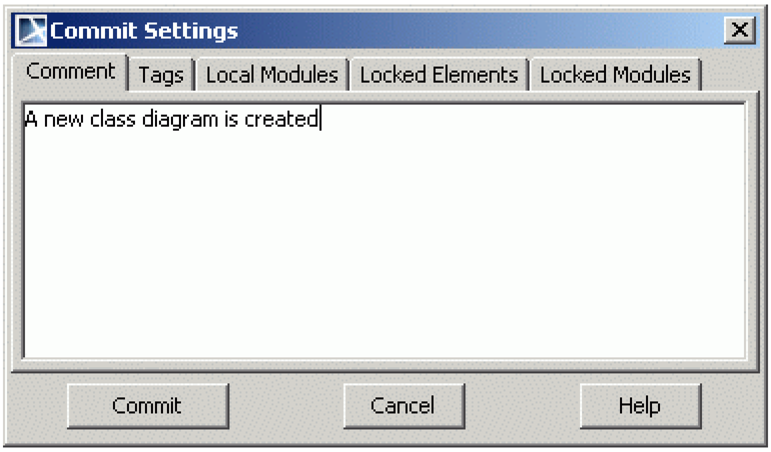
1. From the **Teamwork** main menu, open a teamwork project by choosing **Open Teamwork Project.** The **Open Teamwork Project** dialog box appears**.** If no projects are available, you can add a new one by clicking the **Add** button. Click **Open.**



2. Look at the Browser tree. The items in the Browser tree are blank and they can be read, but no editing is allowed. A user may add new elements and edit only those elements that he/she has locked for editing.

STEP #3 Commit Project to Teamwork Server

1. Create a new class diagram and name it. Draw any elements and relationships in the class diagram.
2. Commit the diagram to the Teamwork Server. From the **Teamwork** menu, choose **Commit Project** (you can use CTRL+K shortcut key instead). The **Commit Settings** dialog box appears. If needed, you may enter any commit comments or tags.



A new class diagram is created

NOTE! If you have some elements locked for editing, the list of them is displayed in the **Locked Elements** tab. Select elements if you want to unlock them after committing project.

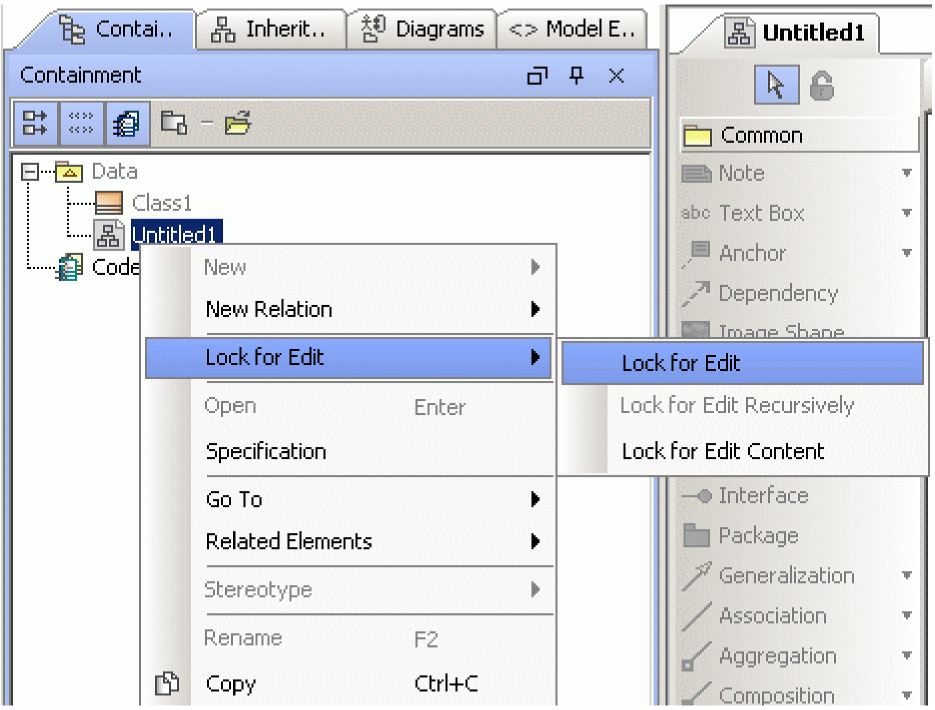
If your project uses some local modules, list of them is displayed in the **Local Modules** tab.

The **Locked Modules** tab displays list of modules, which are locked in this project.

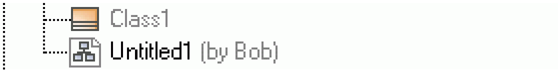
3. Click **Commit**.
4. After committing the diagram for the first time, it becomes read-only and it is blank in the Browser tree.

STEP #4 Lock elements for editing

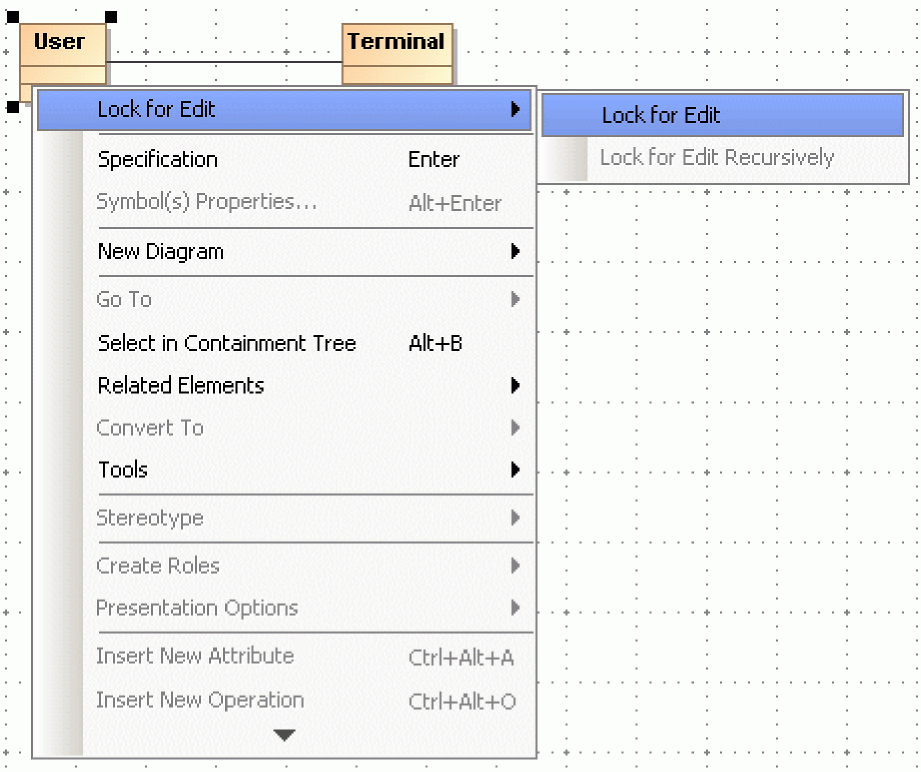
1. In the Browser tree, from the class diagram shortcut menu, choose the **Lock for Edit** command and then **Lock for Edit**.



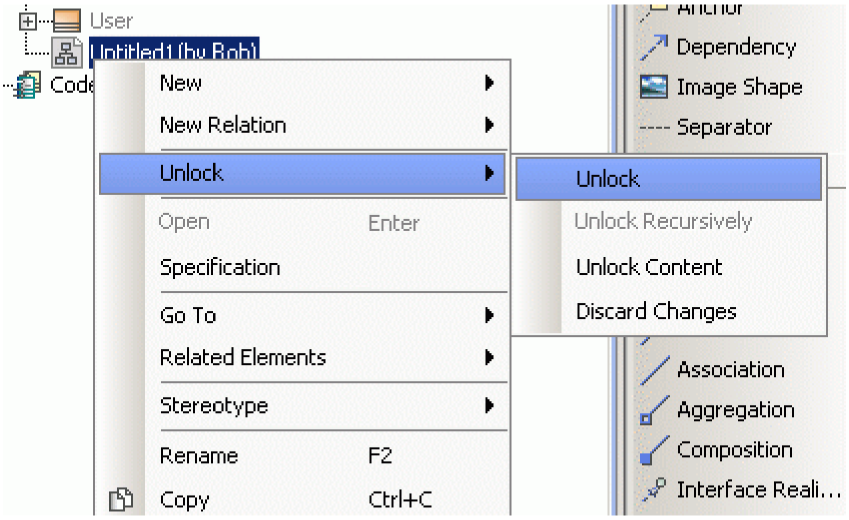
2. In the Browser tree, appears a name of a user who has locked the class diagram for editing.



3. To lock any class from a diagram for edit, from its shortcut menu, choose the **Lock Class for Edit** command and then **Lock for Edit**.


User
Terminal
Lock for Edit
Specification Enter
Symbol(s) Properties... Alt+Enter
New Diagram
Go To
Select in Containment Tree Alt+B
Related Elements
Convert To
Tools
Stereotype
Create Roles
Presentation Options
Insert New Attribute Ctrl+Alt+A
Insert New Operation Ctrl+Alt+O
Lock for Edit
Lock for Edit Recursively

4. Perform some changes for a class. Click CTRL+K to commit changes. The diagram that was edited once again does not become read-only, and it is left editable for the user who has locked it.
5. In order to unlock the diagram, in the Browser tree, from the class diagram shortcut menu, choose the **Unlock** command and then **Unlock**.



NOTE! If you select the **Discard Changes** command, you may unlock a diagram and discard any changes that were made by the user who has locked the diagram.

6. In the same way classes and other elements of a diagram are unlocked.

STEP #5 update teamwork project

NOTE! You have to update a teamwork project from time to time. It is necessary to receive changes made by other users who have edited a teamwork project.

- From the **Teamwork** main menu, choose **Update Project**. All the changes made by other users will appear in the project version that you have.

XML SCHEMA MODEL CREATION

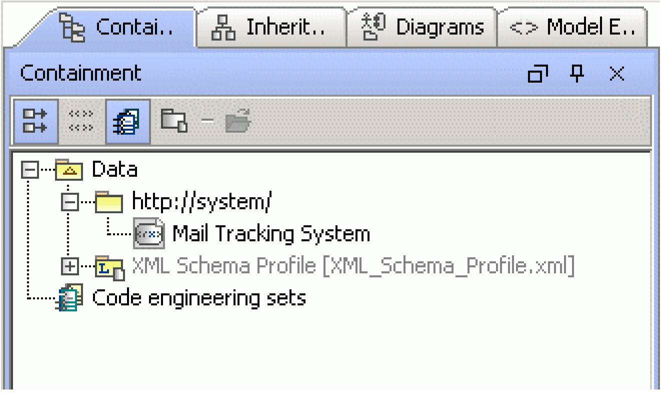
This guide contains step-by-step instructions, showing how to create a basic XML schema model (and then generate the schema from this model) from scratch.

STEP #1 Create XML Schema Diagram Model

1. Create a new project.
2. In the Browser tree, from the **Data** package shortcut menu, choose **New Diagram** and then **XML Schema**. Specify the name of this diagram directly in the Browser - e.g. *Mail Tracking System* as in our example.

- You may also create XML Schema diagram from the Diagram toolbar menu by clicking the **XML Schema Diagram** button or from the **Diagrams** main menu, choosing **XML Schema Diagram**.

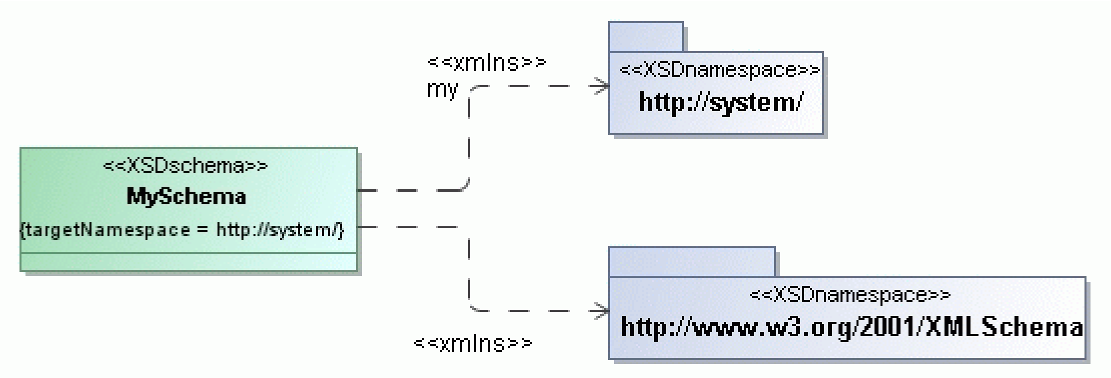
3. To create a namespace in this diagram, on the diagram elements toolbar, click the XSD-Namespace button (or press **P**) and then click anywhere on the diagram pane. Type the name (*http://system/* in our example) for the namespace. This namespace will be the main container for the types of the schema.
4. To speed up further development, in the Browser tree, drag created XML Schema diagram to the namespace package.



Data
- http://system/
  - Mail Tracking System
- XML Schema Profile [XML_Schema_Profile.xml]
- Code engineering sets

5. Add the http://www.w3.org/2001/XMLSchema namespace package to the diagram - expand the XML Schema Profile, select this package and drag it into the diagram pane.
6. Draw the XSDSchema element in diagram and link both namespaces with xlmns relationship.
7. Specify names for relationships. These names will be mapped to the namespace prefix in the resulting .xsd file. Double-click on the relation to open the **Element Import Specification** dialog box and in the **Alias** field type the name, which will appear on diagram pane. You can leave one of these relationships without name - this will be the default namespace of the schema.
8. Double click the schema element and in the opened **Specification** dialog, click on the **Tags** tab. Expand the <<*XSDSchema*>> branch and select *targetNamepsace* tag. Click the **Create**

Value button. In the **Select Elemets** dialog, select http://system/ namespace and add it to the list by clicking **Add**.

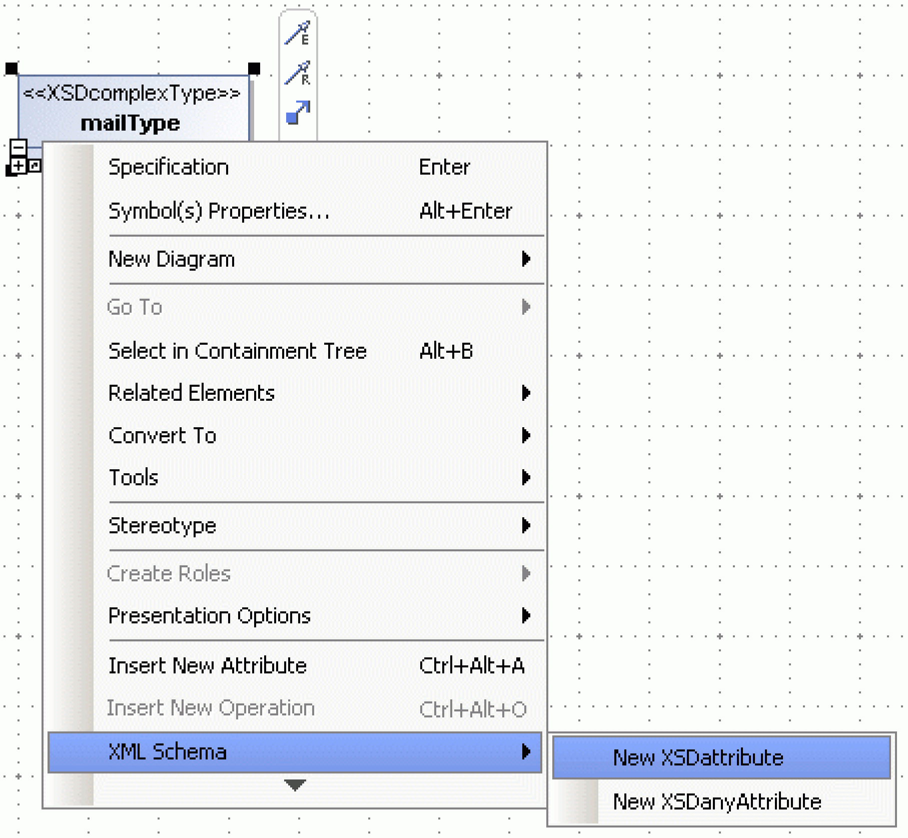


9. Such a model will result (after code generation) in schema like this:

```
<schema targetNamespace=http://system/
xmlns="http://www.w3.org/2001/XMLSchema"
xmlns:my="http://system/"/>
```

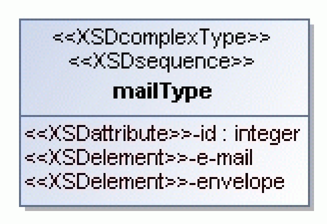
STEP #2 Create Model Types

1. In the elements toolbar, click on the XSDcomplexType button and draw new type on the diagram pane. Name it as *mailType*.
2. Right-click on this type and from the shortcut menu, choose **XML Schema** and then **New XSDattribute**.

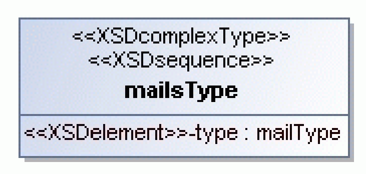


3. Type the *id* name for new attribute. Double-click to open the **Property Specification** dialog box and assign *integer* type in the **Type** field.
4. Select *mailType* element and from the shortcut menu, choose Stereotype. Apply <<*XSDsequence*>> stereotype for this element. This will enable inner element creation for complex type.

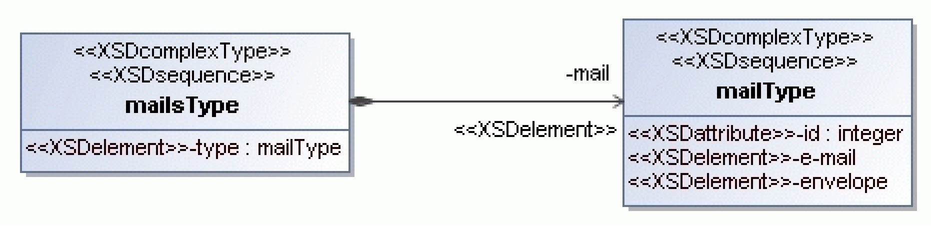
5. Right-click on the type again and from the shortcut menu, choose **XML Schema** and then **New XSDelement**. Name this element as *e-mail*. In the same manner, add another element, named *envelope* .



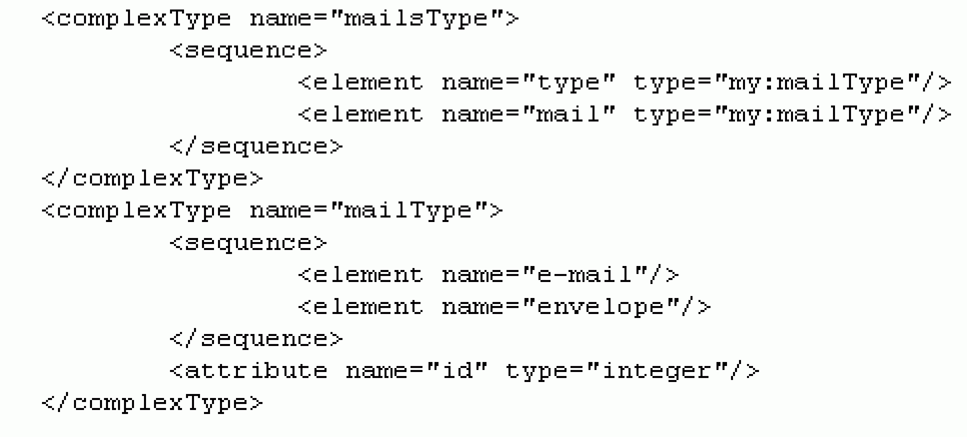
6. Draw another XSDcomplexType element on the diagram and name it as *mailsType.*
7. When choosing types for elements, you may use either primitive typed for XML schemas from the ***XML Schema Profile*** or your modeled types. Add new XSDelement *type* to mailsType and double-click to open the **Property Specification** dialog box. In the **Type** field assign previously created *mailType* element as a type.



8. It is possible to put the name of the element on the appropriate end of the association relation. Draw composition between *mailsType* and *mailType,* add a name and assign *<<XSDelement>>* stereotype to the association end. From the end shortcut menu, choose **Edit Name** and then on the diagram pane, type *mail*.



9. After code generation, this model will result in the following source code::

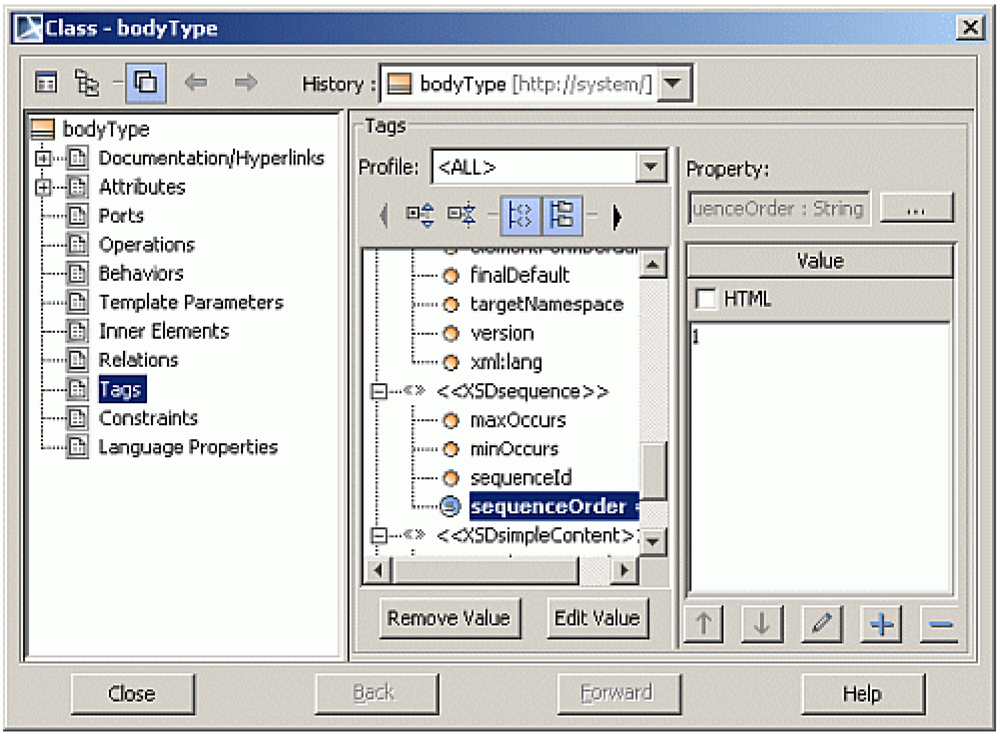


```
<complexType name="mailsType">
        <sequence>
                <element name="type" type="my:mailType"/>
                <element name="mail" type="my:mailType"/>
        </sequence>
</complexType>
<complexType name="mailType">
        <sequence>
                <element name="e-mail"/>
                <element name="envelope"/>
        </sequence>
        <attribute name="id" type="integer"/>
</complexType>
```

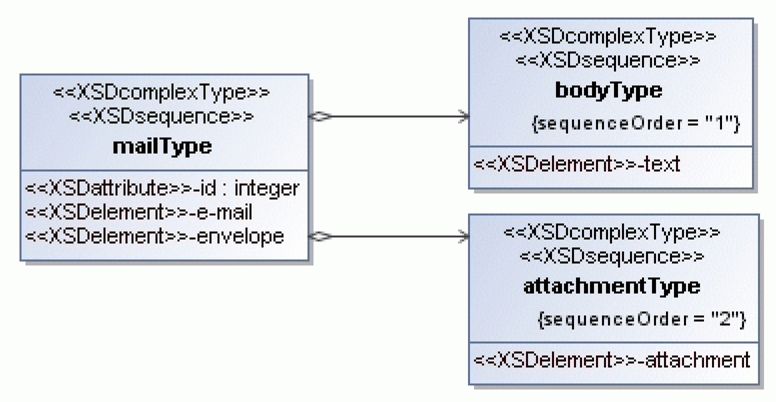
STEP #3 Specify Sequence Order

1. Create two more XSDcomplexType elements *attachmentType* and *bodyType.* Add appropriate XSDelements to them - *attachment* and *text.*
2. Draw aggregation link from the *mailType* element to these two newly created elements.

3. Double-click the *bodyType* element to open its Specification dialog box. Select the **Tags** tab and in the <<*XSDSequence*>> branch add new tagged value **"1"** for sequenceOrder tag.



4. Repeat the same action for *attachmentType* element, just add tagged value "2".
5. Such model after all these actions is created:

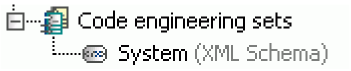


6. Such source will be generated from this example:

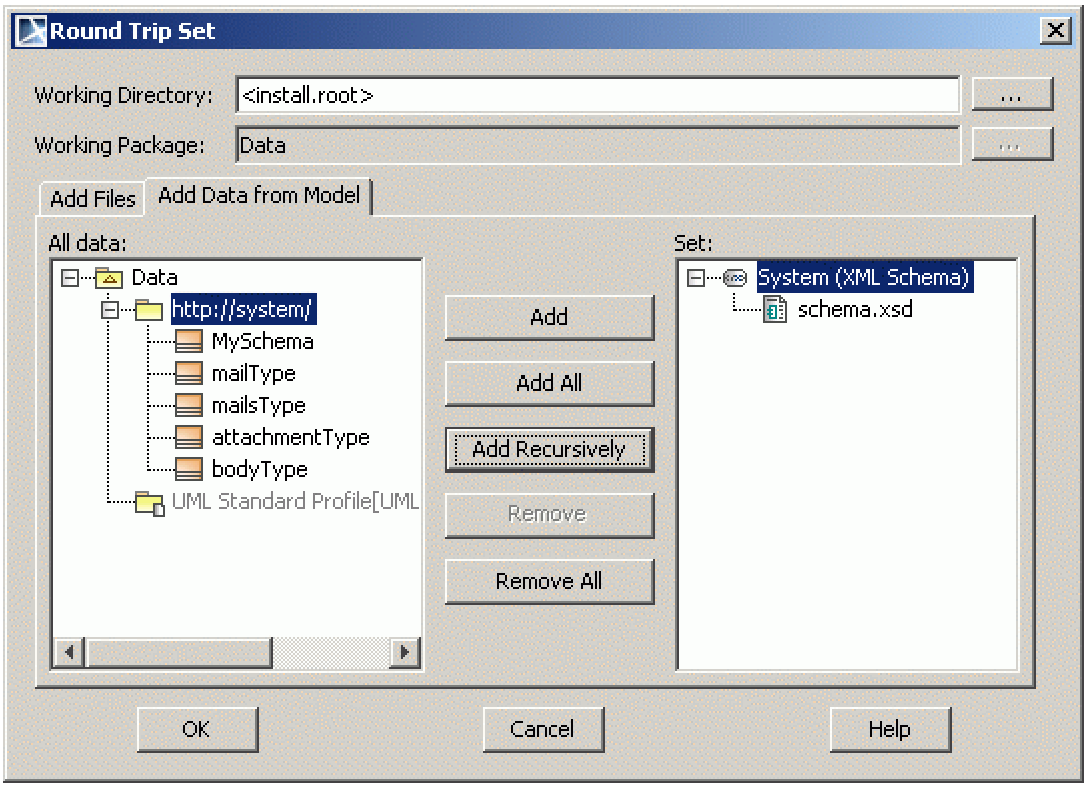
```
<complexType name="attachmentType">
        <sequence>
                <element name="attachment"/>
        </sequence>
</complexType>
<complexType name="bodyType">
        <sequence>
                <element name="text"/>
        </sequence>
</complexType>
```

STEP #4 Code Generation from Schema Model

1. Right-click the Code Engineering Sets in the Browser tree. From the shortcut menu choose **New** and then **XML Schema** language. Type the name for set directly in the Browser. A new XML Schema set is created.



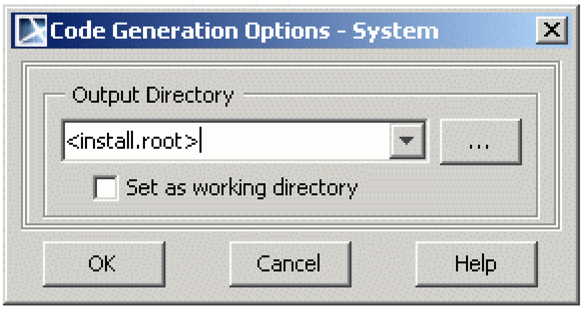
2. From the created code engineering set shortcut menu, choose **Edit**. Open the **Add Data from Model** tab in the **Round Trip Set** dialog box. From the **All Data** list to the **Set** list, add XML Schema elements for code generation. Click **OK**.


Round Trip Set

Working Directory: <install.root>

Working Package: Data

3. From the code engineering set shortcut menu, choose Generate. The **Code Generation Options** dialog box opens:


Code Generation Options - System

Output Directory: <install.root>

□ Set as working directory

4. Specify Output Directory for source code and click **OK**. The *schema.xsd* file containing XML Schema code will be generated there.