



WhiteStarUML

© 2013 Janusz Szpilewski, Albert Zuurbier

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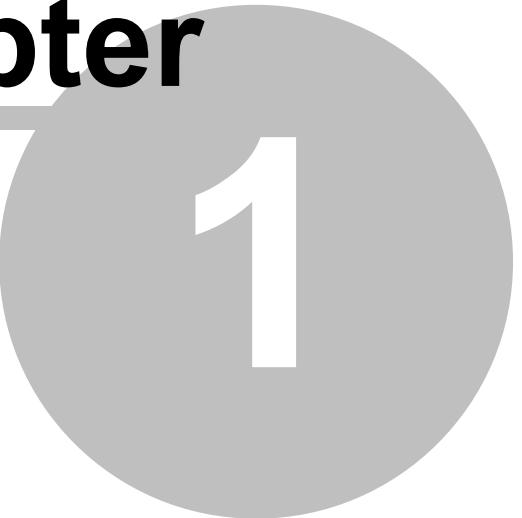
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Chapter



1

1 Introduction

WhiteStarUml is a fork of StarUML with an intent to revive its Delphi code base by updating code to recent Delphi editions, reducing dependence on third party components and fixing bugs and adding new features.

1.1 Key to the Guide

Overview

Start here if you are new to WhiteStarUml. This section talks about Model Driven Architecture (MDA) which will be described later in the user guide. You will also find the key features of the application and what it will bring you. Please review the system requirements to make sure that your hardware will be able to run the software, the requirements are remarkably low.

Basic Concepts

WhiteStarUml is not difficult to use, but knowing the basic concepts will help you get started quickly. This is a good section to start reading when you have successfully installed WhiteStarUml and want to make full use of the application. Knowing how the basic concepts relate to each other will make reading the rest of the guide easier.

Managing Projects

You may skip this section at first, but you will return to this section no matter how good your diagrams already are. This section is all about organizing your project in a sensible way. This section is especially useful if you want to distribute the modeling work over multiple designers and architects. Project leaders should pay attention to this section.

Modeling

This section contains general information about how to work with diagrams. The information is applicable to any diagram you want to make. WhiteStarUml provides several ways to work with a model and after reading this section you can decide which way is best for what situation.

Working with Diagrams

If you know what diagram you want to make, this is the section for you.

This section is the reference for all 11 different diagrams that WhiteStarUml supports. Here you will find the explanation of the semantics (the meaning of an element within a diagram) of all elements in the diagrams. Notice for example how class and object have a consistent meaning in all diagrams.

Program Configuration

You can make WhiteStarUml work for you and in this section you can read how to. You can configure the program as a whole and with increasing detail you can configure almost any part of the application.

Managing Modules

Modules are the means to extend the functionality of WhiteStarUml. As WhiteStarUml will grow in popularity more modules will become available. Modules may provide new types of diagrams or add some useful functionality not available in the base. This section is for advanced users that need to install or remove a module.

Generating Code and Documents

The pinnacle of software modeling starts here: round trip software engineering. Create code and documentation from your model and create or update your model from your code. You will use templates to generate code and documentation. Creating or updating the model will require a reverse-engineering module. The basics of this advance topic are explained in this section.

Verifying Model

A good model is needed for good diagrams, but eventually it is all about the model. Testing the model is used to make sure it all makes sense within the context of UML. That test is called model verification. Model verification is an advance topic.

Printing Diagrams

Your diagrams are only useful if you can show the diagram to others and can discuss the diagram. Read this section before presenting your work. This section provides some tips and tricks for printing without a headache.

User-Interface Reference

The complete reference to the user interface. Every detail of the user interface is explained in a general manner. For details how to use those user interface elements in diagrams, refer to the specific diagrams in the Working with Diagrams section.

Appendices

In the appendices you will find background information. For example, the appendices contain the full text of the licenses under which the software and documentation of WhiteStarUml is published.

Chapter

2

2 Overview

WhiteStarUml is actively developed and with each version we come closer to our goals. With version 5.3 for example, Unicode is supported for creating element names. We have accomplished this by replacing the original text parser with a Unicode compatible parser. These changes make StarUML better to work with, more intuitive and hence easier in use.

Delphi as the principal development language was a main force behind the success of StarUML and now WhiteStarUML. The compiled code is lightning fast, while the language prevents many coding errors and thus provides a huge productivity boost for developers. Thanks to its productivity boost the project could grow and gain popularity while being backed by a team of several developers. The initial developers moved into other ventures and after a number of years of silence, development is now picked up by a new generation of developers, headed by Janusz Szpilewski.

As with every Open Source project comes a community and by reading this manual, you are part of that community. You can support the WhiteStarUml community in different ways.

- Submit trouble tickets. If you find bugs please submit a ticket at WhiteStarUml ticket pages. A ticket helps us focus on the problems that affect our users. Before you submit a ticket, please browse through the existing tickets to see if a ticket related to your issue already exists. Workarounds maybe available in the comments of existing tickets.
- Contribute to discussions. If you have a question about the application and cannot find an answer in this manual, then ask your question in the WhiteStarUml forums. Try to avoid sending emails to the developers, there are many more people available in the forums to answer your questions than there are developers on the project.
- Understand OpenSource. OpenSource is not necessarily free. The source is open for you to read, inspect and suggest or provide improvements to the code. We publish the software under the GNU General Public License, which means you can use the code as the basis for your own fork of free and OpenSource software but you cannot use the code to remove existing copyright holders and sell the software yourself. If you want to make money from this application, please let us share. OpenSource is all about sharing and respect. For more on the license you bind yourself to by using WhiteStarUml see the appendices

2.1 What is WhiteStarUML?

WhiteStarUml is a software modeling platform derived from StarUML that supports UML (Unified Modeling Language). It is based on UML version 1.4 and provides eleven different types of diagram, and it accepts UML 2.0 notation. It actively supports the MDA (Model Driven Architecture) approach by supporting the UML profile concept.

WhiteStarUml excels in customizability to the user's environment and has a high extensibility in its functionality. Using WhiteStarUml, one of the top leading software modeling tools, will guarantee to maximize the productivity and quality of your software

projects.

UML Tool that Adapts to the User

WhiteStarUml provides maximum customization to the user's environment by offering customizing variables that can be applied in the user's software development methodology, project platform, and language.

True MDA Support

Software architecture is a critical process that can reach 10 years or more into the future. The intention of the OMG (Object Management Group) is to use MDA (Model Driven Architecture) technology to create platform independent models and allow automatic acquisition of platform dependent models or codes from platform independent models. WhiteStarUml truly complies with UML 1.4 standards, UML 2.0 notation and provides the UML Profile concept, allowing creation of platform independent models. Users can easily obtain their end products through simple template document.

Excellent Extensibility and Flexibility

WhiteStarUml provides excellent extensibility and flexibility. It provides Add-In frameworks for extending the functionality of the tool. It is designed to allow access to all functions of the model/meta-model and tool through COM Automation, and it provides extension of menu and option items. Also, users can create their own approaches and frameworks according to their methodologies. The tool can also be integrated with any external tools.

2.2 Key Features

WhiteStarUml has the following features.

Feature	Description
Accurate UML standard model	WhiteStarUml strictly adheres to the UML standard specification specified by the OMG for software modeling. Considering the fact that the results of design information can reach 10 years or more into the future, dependence on vendor-specific irregular UML syntax and semantics can be quite risky. WhiteStarUml maximizes itself to order UML 1.4 standard and meaning, and it accepts UML 2.0 notation on the basis of robust meta model.
Open software model format	Unlike many existing products that manage their own legacy format models inefficiently, WhiteStarUml manages all files in the standard XML format. Codes written in easy-to-read structures and their formats can be changed conveniently by using the XML parser. Given the fact that XML is a world standard, this is certainly a great advantage, ensuring that the software models remain useful for more than a decade.
True MDA support	WhiteStarUml truly supports UML Profile. This maximizes extensibility of UML, making modeling of applications possible even in areas like finance, defense, e-business, insurance, and

	aeronautics. Truly Platform Independent Models (PIM) can be created, and Platform Specific Model (PSM) and executable codes can be automatically generated in any way.
Applicability of methodologies and platforms	WhiteStarUml manipulates the approach concept, creating environments that adapt to any methodologies/processes. Not only the application framework models for platforms like .NET and J2EE, but also basic structures of software models (e.g. 4+1 view-model, etc.) can be defined easily
Excellent extensibility	All functions of the WhiteStarUml tools are automated according to Microsoft COM. Any language which supports COM (Visual Basic Script, Java Script, VB, Delphi, C++, C#, VB.NET, Python, etc.) can be used to control WhiteStarUml or develop integrated Add-In elements.
Software model verification function	Users can make many mistakes during software modeling. Such mistakes can be very costly if left uncorrected until the final coding stage. In order to prevent this problem, WhiteStarUml automatically verifies the software model developed by the user, facilitating early discovery of errors, and allowing more faultless and complete software development.
Useful Add-Ins	WhiteStarUml includes many useful Add-Ins with various functionalities: it generates source codes in programming languages and converts source codes into models, imports Rational Rose files, exchanges modeling information with other tools using XMI, and supports design patterns. These Add-Ins offer additional reusability, productivity, flexibility and interoperability for the modeling information.

2.3 System Requirements

The following are the minimum system requirements for running WhiteStarUml.

- Intel® Pentium® 233MHz or higher
- Windows XP, or higher with .NET 2.0 or higher installed. Windows 7 or 8 recommended.
- 128 MB RAM (256MB recommended)
- 110 MB hard disc space (150MB space recommended)
- CD-ROM drive
- SVGA or higher resolution monitor (1024x768 recommended)
- Mouse or other pointing device

Chapter

3

3 Basic Concepts

To use WhiteStarUml effectively, you need to understand some basic concepts. The concepts discussed in this chapter, except for the modules, are found in UML. Once you know how those concepts translate to WhiteStarUml, you will be able to easily make the translation from UML talk to WhiteStarUml tasks. Finally you also need to know what a module is and what can be provided in a Module. You will want to have modules and you can help the WhiteStarUml platform by contributing modules.

3.1 Projects and Units

Project

A project is the basic element to organize your work in WhiteStarUml. Your project contains one or more models, subsystems or packages, each of which can contain subsystems and packages. The project is a representation of the system you are developing and contains all the artifacts used to document that system.

A model is a representation of structure of your system. The most direct way to show the model is a class diagram. However, a class diagram is not *the* model. Nor should one class diagram show the whole model of your system.

A subsystem is a larger, more or less independent part of the system. In general a subsystem is a self-contained set of functionality, but larger than a simple component.

A package is a way to group related UML elements. The package provides a boundary for naming the elements. As such, the package provides a namespace. Package names are often used as a prefix for the elements it contains.

In general, one project is saved in one project file.

Project files are saved in the XML format with the extension name ".UML". All models, views and diagrams created in WhiteStarUml are saved in one project file. A project file contains the following information.

- UML profiles used in the project
- Unit files referenced by the project
- The models, subsystems and packages contained in the project
- Diagrams contained in the project

A project may be divided into and saved in multiple units.

Units

While a project is generally saved in one file, there are cases where one project needs to

be separated into smaller files so that multiple developers can work on the project simultaneously. In this case, the project can be managed as multiple units. A unit can have a hierarchical structure; it may contain many sub-units under it. Units are saved in XML format, with the extension ".UNT".

A unit represents one model, subsystem or package. All elements under the model, subsystem or package are saved in the respective unit file.

A unit file is referenced by project files or other unit files.

Just as a project can reference many units, a unit also can reference many sub-units. Given this parent-child relation, you can build a hierarchical unit structure.

Model Fragments

A model fragment is a part of a project saved as a separate file. Only model, subsystem or package items can be saved as model fragments. Model fragments are saved in XML format, with the extension ".MFG".

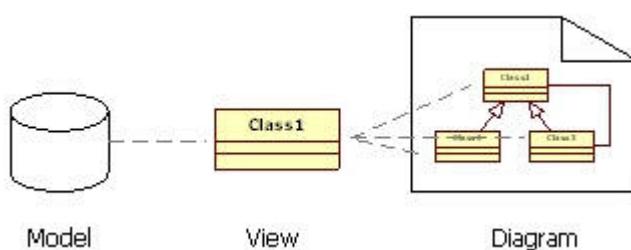
Model fragment files allow the easy reuse of part of a model. Model fragments are essentially different from units in that once included in a project, they merge completely with the rest of the project.

3.2 Model, View and Diagram

WhiteStarUML makes a clear conceptual distinction between models, views and diagrams.

A **Model** represents the structure of the system under development. The model contains **Model Elements**. The model elements represent concepts from the system under development.

A **Diagram** is a visualization of (part of) the model and represent the user's specific design thoughts. The diagram contains **View Elements**. The view element is the visualization of a model element. One model element can have different view elements in different diagrams. What a view element looks like depends on the defined notation for the diagram type.

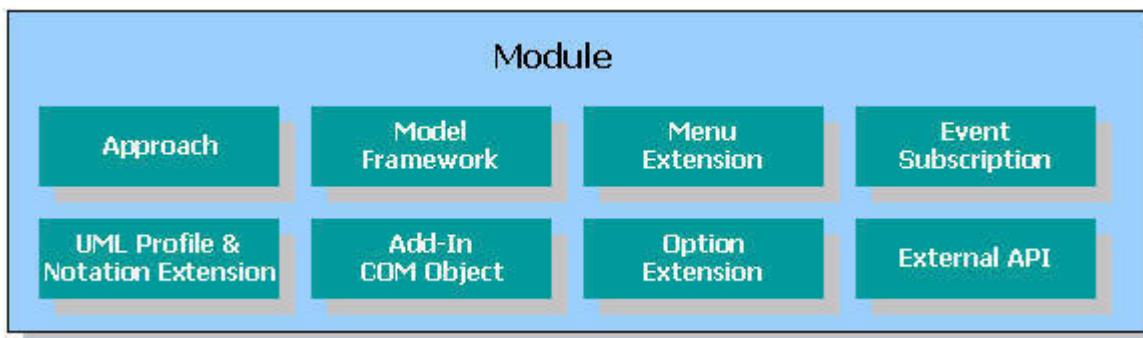


Note: The above View Element is not related to the View in an approach.

3.3 Module, Approach, Framework and Profile

Module

The module is the main way of extending WhiteStarUml functionality. The module can be created as a combination of several extension elements. Not only can you combine extension elements into an independent module for a specific purpose, but you can also modify the behavior of elements of another module or the main platform to meet your needs.



WhiteStarUml modules provide the following functions.

- Addition of new approach
- Addition of frameworks
- Expansion of the main menu or popup menu.
- Addition of new profile
- Addition of new element through stereotype or expansion of notation
- Implementation of new function (through COM Server or simple script file)
- Integration with other applications
- Other Add-In functions

Approaches

There are countless methodologies for software development, and each company or organization has its own, or uses an existing one that is modified to meet the requirements of its development team or projects. Application domains, programming languages, and platforms are also different for each piece of software developed. Consequently, many items have to be configured in the initial phase of software modeling. WhiteStarUml provides the concept of approaches to facilitate easier configuration of such items.

An approach consists of the following items.

Approach Component	Description
Project Structure	Specifies the basic structure of the project. The basic structure can be designed with package, subsystem and model elements. The diagram can also be given a default layout.
Import Profiles	Automatically includes the default UML profiles in the project.
Import Frameworks	Automatically loads and includes the default frameworks in the project.
Import Model fragments	Automatically loads and includes the default model fragments in the project.

Frameworks

Frameworks in WhiteStarUml refer to software models that express class libraries or application frameworks like MFC, VCL, and JFC. Including and using frameworks in projects makes it much easier for the user to model software that depends on specific class libraries or application frameworks.

A framework consists of one framework file (.FRW) and one or more unit files (.UNT).

Component	Description
Framework File(.FRW)	Framework files contain information for the units included and the UML profiles used.
Unit File(.UNT)	Unit files contain actual model information for the framework.

UML Profile

The Unified Modeling Language (UML) is so general that it can be used to express many thoughts or concepts. This can also be the source of its weakness, as concepts of specific domains cannot be expressed in fine detail. To overcome such weakness, WhiteStarUml provides UML profiles that expand UML. WhiteStarUml supports easy expansion of UML by directly accommodating the concepts in UML profiles.

A UML profile consists of the following components.

Component	Description
Stereotype	The Stereotypes are attached to specific UML elements to further clarify their semantics and provide extension attributes, making more accurate modeling possible. The stereotype specifies not only icon file to express graphic notation but also defines notation schema method as using extension notation defined file(.PNX). For more detail about extension notation, refer to developer's guide.
TagDefinition	When the default UML element properties are inadequate for accurate modeling, tag definition provide additional information for the elements. In WhiteStarUml, tag definitions can either be included in specific stereotypes or exist independently.
DataType	The datatype that is contained in the profile by default.
DiagramType	The DiagramType is extension element suggested by WhiteStarUml to define

	new diagram types.
ElementPrototype	The element prototype is an extension element suggested by WhiteStarUml to define a sample for creating element as configuring attributes in the present defined element. These defined element prototypes can create elements as linked to a palette or create elements through an external API.
ModelPrototype	The model prototype is an extension element suggested by WhiteStarUml similar to element prototype, but it applies only to a model. An element defined as model prototype shows up on the model addition menu.
Palette	The Palette is an extension element suggested by WhiteStarUml to add palettes.

For detailed descriptions on writing profiles, see the WhiteStarUml Developer guide.

The OMG (Object Management Group) specifies UML profile standards for specific purposes. UML Profiles that adhere to the standard can be processed by other tools than WhiteStarUml. As an example, UML Profiles are used for the following.

- Specific programming languages (C/C++, Java, C#, Python, etc.)
- Specific development methodologies (RUP, Catalysis, UML Components, etc.)
- Specific domains (EAI, CRM, SCM, ERP, etc.)

WhiteStarUml contains several modules out of the box.

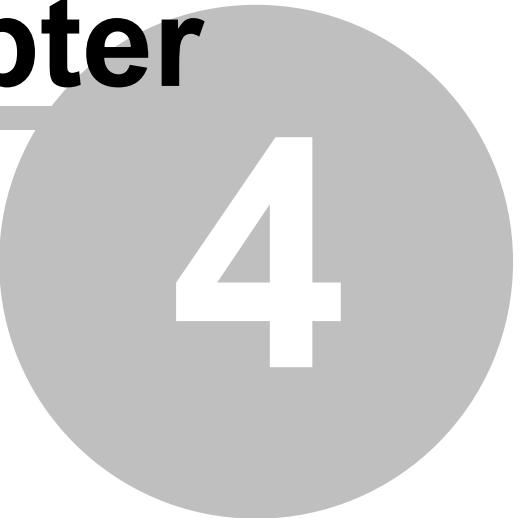
- WhiteStarUml basically provides UML standard profile, a few approaches and standard functionality to provide transformations between sequence & collaboration diagram.
- A Generator module to generation for document and code.
- A Java module to support Java profile, J2SE/J2EE Framework, code generation, reverse engineering.
- A C++ module to support C++ profile, MFC Framework, code generation, reverse engineering.
- A C# module to support C# profile, .NET BCL framework, code generation, reverse engineering.
- An XMI module to support XMI import & export for model exchange.
- A Rational Rose module to read Rational Rose Files.
- A Pattern module to support design patterns.

Addition of Module

If you install modules that are developed by users or distributed by third party vendors, you can use the extension functions in WhiteStarUml. In order to install new additional modules in a system, complicated authentication is not needed.

For more information about working with modules, see Managing Modules.

Chapter



4

4 Managing Projects

Although a project can be managed as one file, it may be convenient to divide the project into units and manage them separately. Model fragments can be used for saving and reusing parts of a project. Frameworks make the libraries of a programming environment available for modeling. Profiles provide the implementation details of a programming language to your project.

4.1 Creating a Project

In order to work on a new system, you must create a new project. You may start with a completely empty project or with a new project that is initialized according to a specific approach.

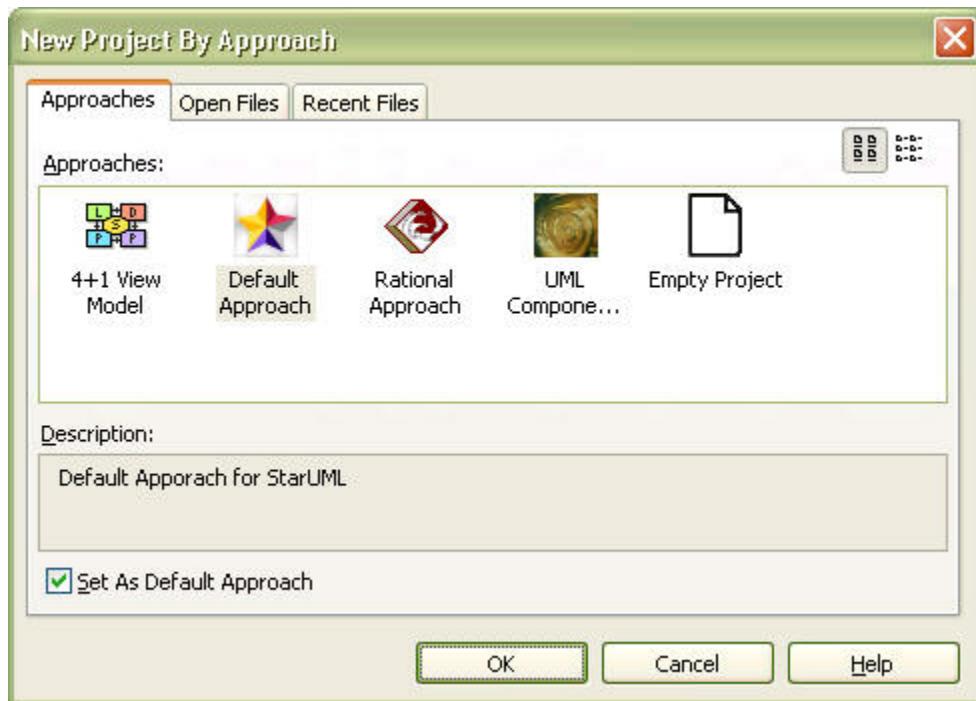
A project can be created based on the default approach or you can choose which approach to use when creating the project. When you find yourself using the same approach every time you start a project, you can set the default approach.

To create a new project based on the default approach, do the following.

1. On the **File** menu, click **New Project**.
2. A new project is created. Depending on the approach, profiles and frameworks are included

To choose the approach when creating a project, do the following.

1. On the **File** menu, click **New Project By Approach**.
2. In the **New Project By Approach** dialog, choose an approach and click **OK**.
3. A new project is created. The project includes the profiles and framework from the selected approach.



 **Note:** The list of the available approaches may differ depending on installed modules.

To set the default approach, do the following.

1. On the **File** menu, click **New Project By Approach**.
2. In the **New Project By Approach** dialog, select the approach you want to make the default approach from the **Approaches** list and select the **Set As Default Approach** check box.
3. Click **OK**. A new project is created based on the selected approach. From now on you can choose **New Project** on the **File** menu to create a project based on this default approach.

4.2 Opening a Project

To continue work on a saved project, you open the existing project file. If the project includes units, all the related units will also be loaded with the project.

To open a project, do the following.

1. On the **File** menu, click **Open**.
2. In the **Open** dialog box, navigate to folder containing the project file.
3. Select the project file and click **Open**.

You can also open your project when you start WhiteStarUml. When WhiteStarUml starts, the New Project By Approach dialog box appears.

To open a project file from a folder, do the following.

- 1.In the **New Project By Approach** dialog box, click the **Open Files** tab.
- 2.In the **Folders** pane, navigate to the folder containing the project file.
- 3.In the **Files** pane, select the file.
- 4.Click **Open**.

To open a project file you recently worked on, do the following.

- 1.In the **New Project By Approach** dialog box, click the **Recent Files** tab.
- 2.Select the project file you want to work with.
- 3.Click **Open**.

4.3 Saving a Project

To save any changes made to a project, you can either save your changes over the existing project file or save the project as a new file. When a project file is saved, the related units will be saved too.

When you save a new project, you must first give the project a name. Do the following.

- 1.On the **File** menu, click **Save**.
- 2.In the **Save As** dialog box, navigate to the folder where you want to save the project.
- 3.In the **File name** box enter a name for your project
- 4.Click **Save**.

To save a project that has been saved before, click **Save** on the **File** menu or press **CTRL+S**.

To save a project with a new file name, do the following.

- 1.On the **File** menu, click **Save As**.
- 2.In the **Save As** dialog box, navigate to the folder where you want to save the

project.

3. In the **File name** box enter a new name for the project.

4. Click **Save**.

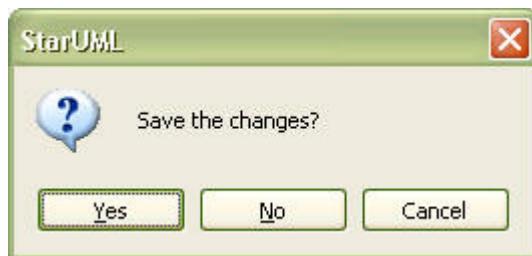
Note: If the project contains one or more units and the units have been changed, a dialog box will appear asking whether you want to save the changed units. Click **Yes** to save all changed units with the project.

4.4 Closing a Project

To close a project, for example to work on another project, do the following.

1. On the **File** menu, click **Close**.

2. If the project was not saved since changes were made, a message will ask you to save the changes. Click **Yes** if you want to save the changes.



3. The project is closed and the panes in the main window will be empty.

4.5 Creating Units

When multiple developers are working on the project simultaneously, the project can be divided into separate units. Dividing the project into units allows version control systems to manage the files individually. Only Package, Model and Subsystem elements can be saved as units.

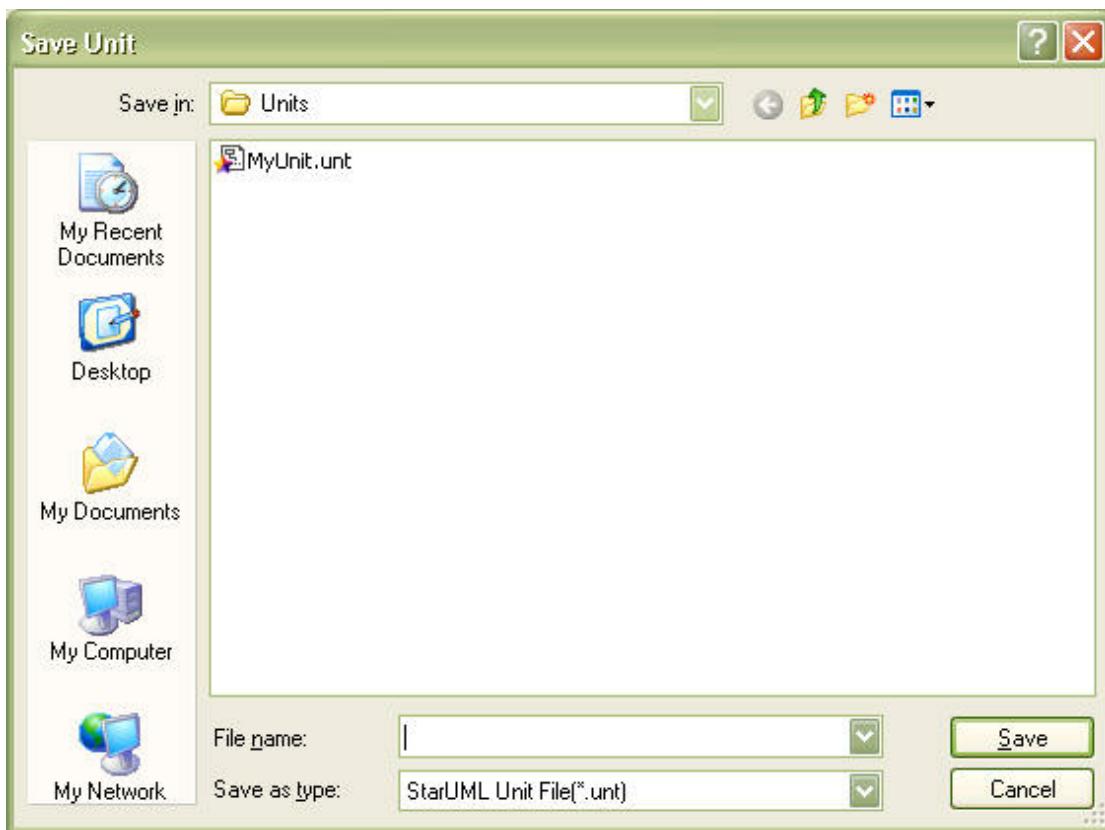
To create a separate unit from a model element.

1. In the **Model Explorer**, select the element you want to separate out as a unit.

2. On the **File** menu, point at **Unit**, and then click **Control Unit**.

3. At the **Save Unit** dialog box, navigate to the folder where you want to save the unit.

4. In the **File name** box enter a name for the unit.



5. Click **Save**.

☒ **Note:** Units are indicated with a small document icon in the **Model explorer**.

☐ TMDistributor
package saved as unit

4.6 Merging Units

If a unit no longer needs to be managed separately, the unit can be merged back in to the project.

To merge a unit in to the project

1. In the **Model explorer** select the unit you want to merge. In the **Model explorer** units are indicated with a small document icon.

☐ TMDistributor
package saved as unit

2. On the **File** menu, point to **Unit**, and then click **Uncontrol Unit**.

 **Note:** Merging a unit does not automatically delete the unit file from disk. Please remove the unit file manually if that file is no longer needed.

4.7 Saving Units

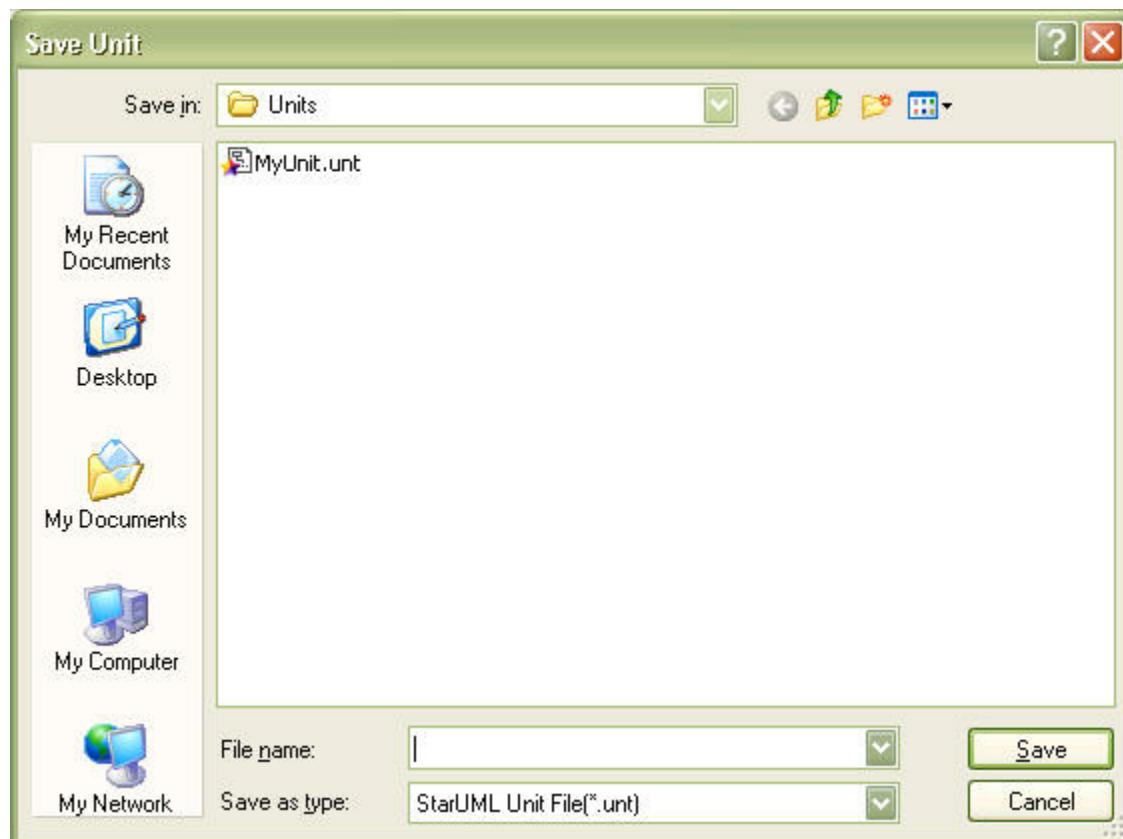
You can save changed unit files to replace the existing unit file or save the unit to a file with another name.

To save the unit:

1. In the **Model Explorer**, select the unit to save.
2. On the **File** menu, point to **Unit**, and then click **Save Unit**.

To save the unit with another name

1. In the Model Explorer, select the unit to save.
2. On the **File** menu, point to **Unit**, and then click **Save Unit As**.
3. In the **Save Unit As** dialog box, enter the new unit file name and click **Save**.



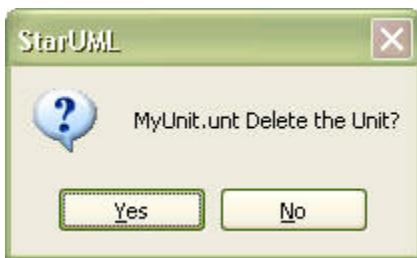
 **Note:** Saving a unit as another file does not delete the original unit file from disk. Please remove the original unit file manually if that file is no longer needed.

4.8 Removing Units

If a unit is no longer needed in a project, the unit file can be removed. Removing a unit deletes all the elements contained of the unit and the unit is no longer loaded in the project. If you do not want to lose the elements contained in the unit, you may want to merge the unit.

To remove a unit file

1. In the **Model Explorer**, select the unit you want to remove.
2. On the **File** menu, point to **Unit**, and then click **Delete Unit**.
3. In the "Delete the Unit" message, click **Yes**.



 **Notes:**

- Alternatively, select the unit in the **Model Explorer** then on the **Edit** menu choose **Delete From Model**.
- Removing a unit does not delete the unit file from disk. Please remove the original unit file manually if that file is no longer needed.

4.9 Creating Model Fragments

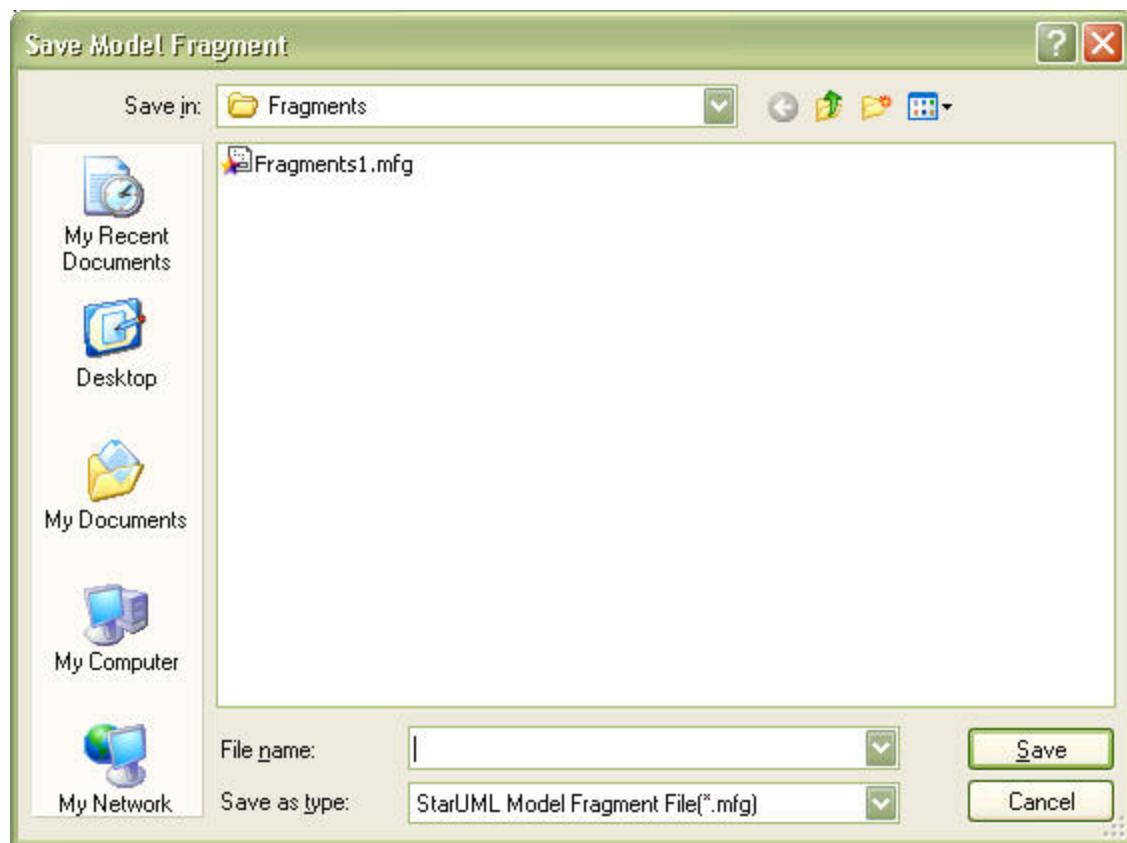
Parts of a project can be saved as separate model fragment files for access by other users or future reuse. Unlike units, model fragments are not referenced by other files and do not reference other files. They are independent entities. Model fragments can be imported in a project at any time.

Use fragments to reuse part of a model in a project. For example, if you use the same authorization model in different projects you can reuse the authorization model by saving that part of the model as a model fragment.

You can create a model fragment from a package, subsystem or model. Fragments are saved in a file with the extension *.mfg.

To create a model fragment

1. In the **Model Explorer** select the element from which you want to create a model fragment.
2. On the **File** menu, point to **Export** and choose **Model Fragment**.
3. In the **Save Model Fragment** dialog box, enter the model fragment file name and click **Save**.

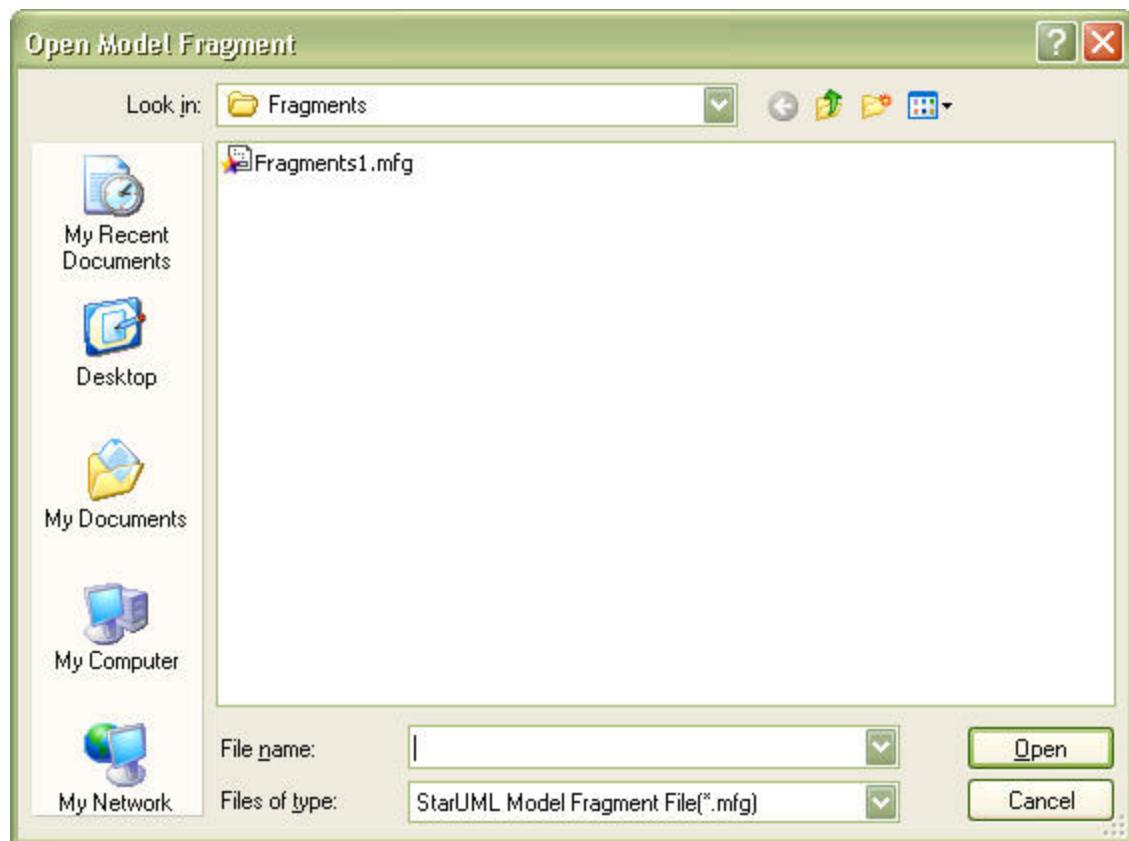


4.10 Importing Model Fragments

You can import elements saved in a model fragment file into your project. Importing a model fragment copies the elements contained in the model fragment into the project. Your project will not store a reference to the imported fragment file.

To import a model fragment

1. On the **File** menu, point to **Import**, and then click **Model Fragment**.
2. In the **Open Model Fragment** dialog box, select a model fragment file and click **Open**.



3. In the *Select a Package where the Model Fragment will be imported to* dialog, choose a package and click **OK**.

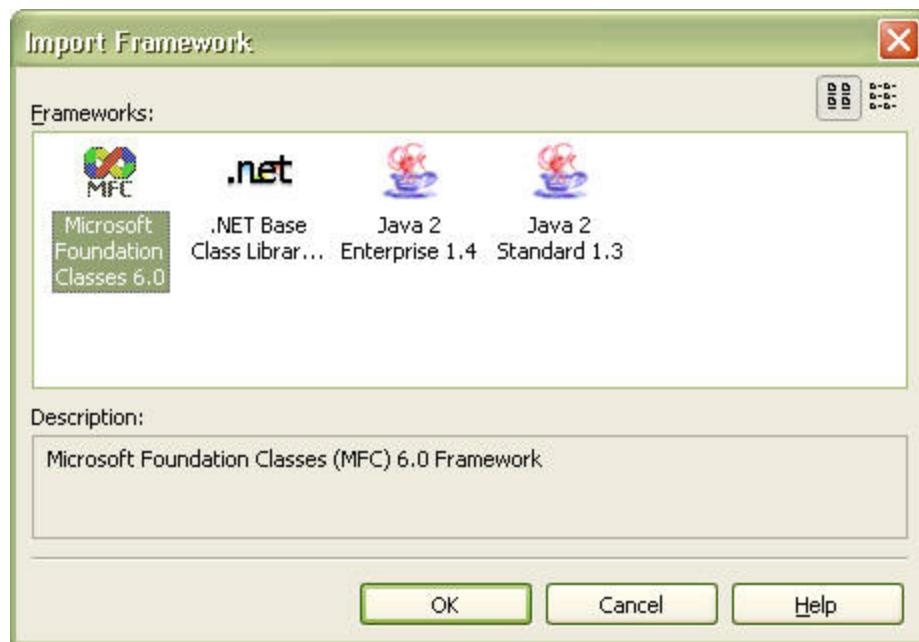
4.11 Importing Frameworks

To use a framework in a project, you must first load the framework. Although approaches may include a framework, not all approaches include a framework. A framework consists of one or more unit files that will be linked to the project. Once the units are loaded, all the elements contained in the units can be used. Framework units are usually read-only and the elements in the framework cannot be modified directly.

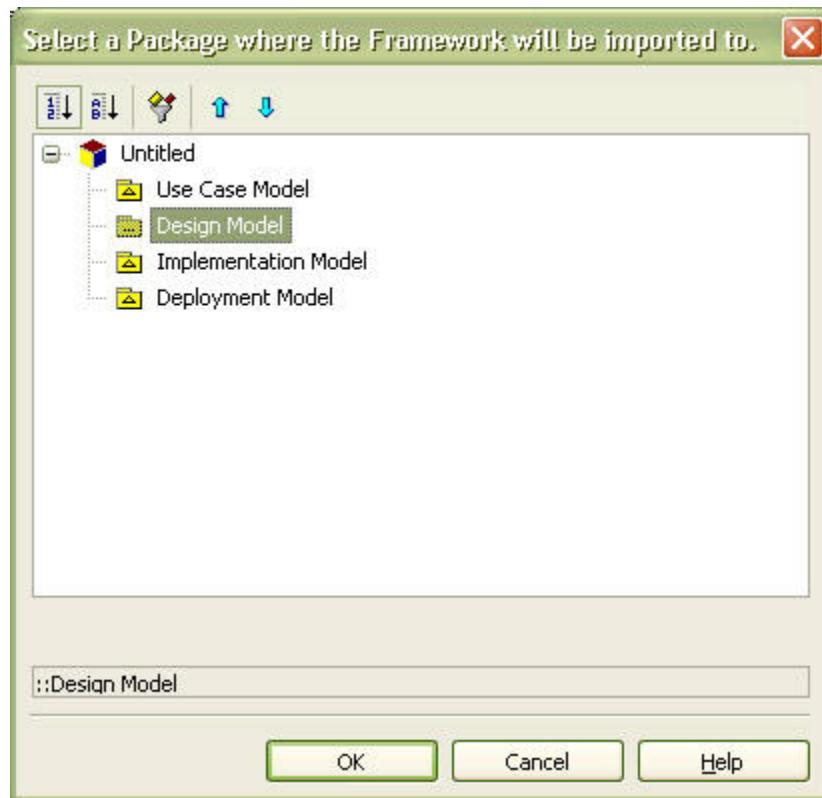
You can import a framework into a model or package.

To import a framework

1. On the **File** menu, point to **Import**, and then click **Framework**.
2. In the **Import Framework** dialog, select a framework and click **OK**.



3. In the *Select a Package where the Framework will be imported to* dialog, select an element and click **OK**.



Notes:

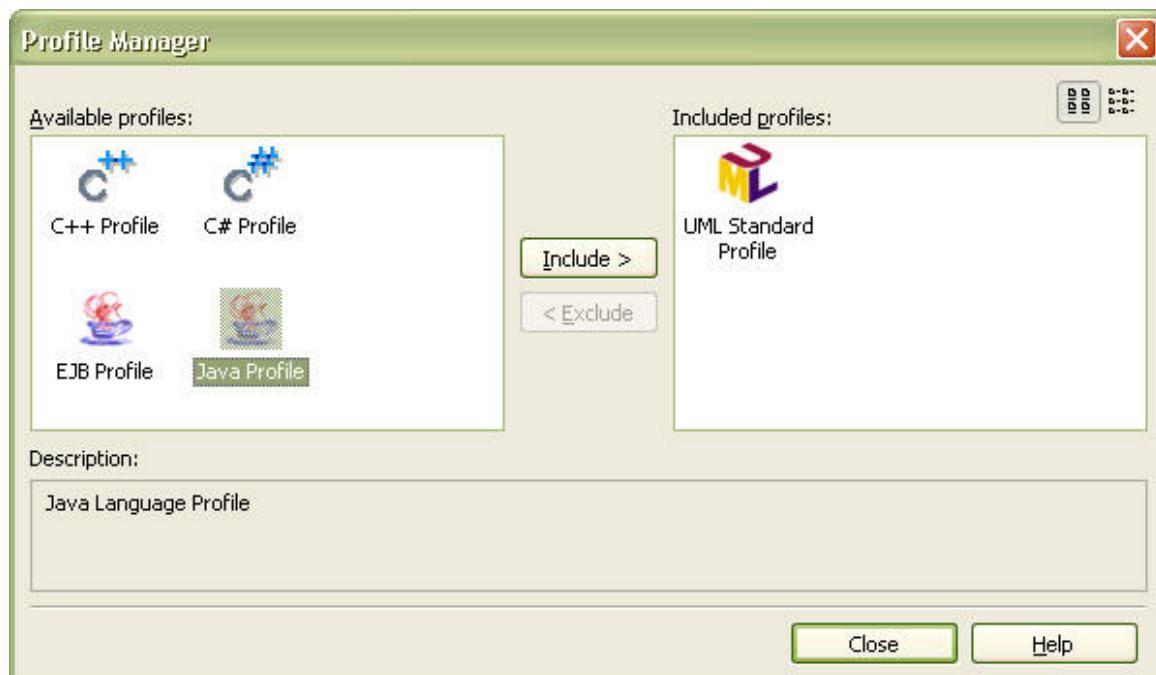
- Importing a framework does not save the framework elements in the project. The framework units are referenced in the project, and the units must be present when the project is opened.
- In order to remove a framework from the project, you have to delete all the units manually.

4.12 Including Profiles

Predefined UML profiles can be included for use with the current project. Once a UML profile is included in a project, the stereotypes, tag definitions and data types defined in the profile can be used in the project.

To include a profile

1. On the **Model** menu, click **Profiles**.
2. In the **Profile Manager** dialog, select a profile from the **Available Profiles** list, click **Include**. The profile appears in the **Included Profiles** list.



3. Click **Close**.

Note

- The profile list in the Profile Manager may vary according to the user's installation environment.

4.13 Excluding Profiles

The UML profiles used in a project can be excluded. If you exclude a UML profile from a project, the stereotypes, tag definitions and data types defined in the profile cannot be used anymore. If you used any of the elements from the excluded profile, then the element may shown incorrectly in the diagram

To exclude a UML Profile

1. On the **Model** menu, click **Profiles**.
2. in the **Profile Manager** dialog, select a profile from the **Included Profiles** list, and then click **Exclude**. The excluded profile will appear in the **Available Profiles** list.



3. Click **Close**.

Notes

- Excluding a profile while its stereotypes and tag definitions are in use may result in loss of information for the related elements. Please exercise caution when excluding profiles.
- The profiles shown in the **Available Profile** list in the **Profile Manager** dialog depend on what modules are installed.

Chapter



5

5 Modeling

Modeling or working with diagrams, requires understanding of the semantics, meaning of what is expressed in a diagram and the meaning of the diagram elements. But, modeling also requires the knowledge about how WhiteStarUml diagrams work. Working with diagrams in the context of the specific diagram is discussed in the next chapter. In this chapter working with diagrams is discussed in the context of WhiteStarUml. The procedures discussed here are applicable to most diagram types.

5.1 Managing Diagrams

Managing diagrams works the same for all diagram types. As with many other tasks in WhiteStarUml you can perform these basic tasks in different ways. You can find instruction on specific diagrams in the chapter Working with Diagrams.

5.1.1 Basic Tasks with Diagrams

Creating Diagrams

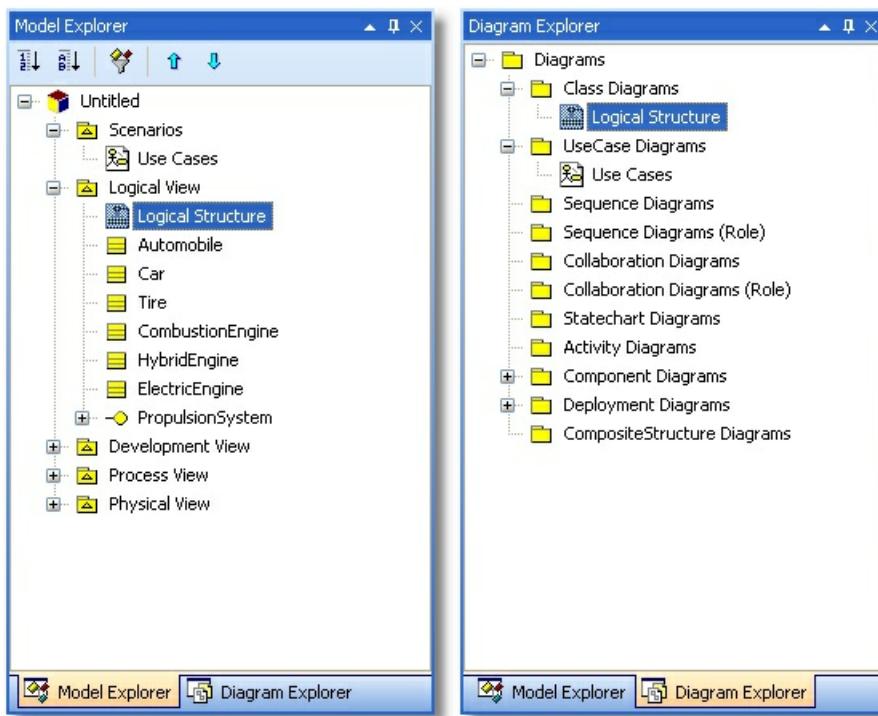
You create a diagram within the context of an element. The element determines for example when and how a qualifying path is shown in the diagram. Structure diagrams can be placed in packages and models. To choose the element for a diagram think of the details you want to show in your diagram. Normally you would choose the package for which you want to show details, most of the elements you show in the diagram would be within the chosen package. Behavioral diagrams are related to the diagram or element for which behavioral detail is shown.

To create a diagram

1. In the **Model Explorer** or in the diagram, select the element for which you want to create a diagram.
2. On the **Model** menu, point to **Add Diagram**, and then click the diagram you want to create. The **Add Diagram** menu only shows the diagrams you can create for the selected element.

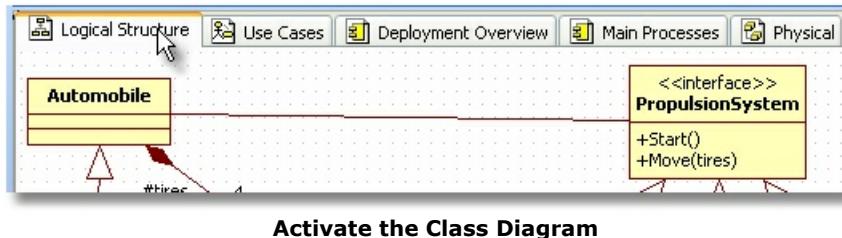
Opening Existing Diagrams

Once created, the diagram is shown in the **Model Explorer** and the **Diagram Explorer**. The Model Explorer shows the structure of the model and shows the diagram with the element for which the diagram was created. **Diagram Explorer** groups the different kinds of diagrams in folders and does not show elements. To open a diagram navigate to the diagram in either the **Model Explorer** or the **Diagram Explorer** and then double-click the diagram.



Model Explorer with Class Diagram Selected Diagram Explorer with Class Diagram Selected

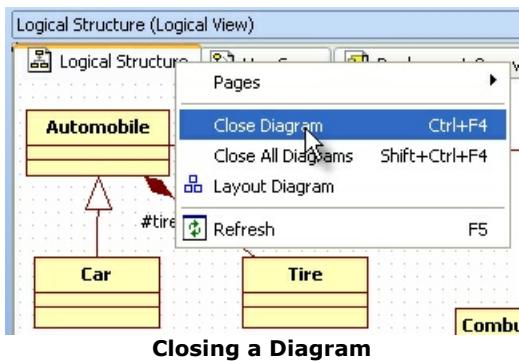
All open diagrams are available in the diagram area, only the active diagram is shown and can be edited. To activate a diagram, click the tab of the diagram at the top of the diagram area. When you double click an already open diagram in the **Model Explorer** or the **Diagram Explorer** the diagram will be activated too.



Activate the Class Diagram

Closing Diagrams

To close a diagram, activate the diagram, then on the **View** menu click **Close Diagram**. As an alternative, to close a diagram, activate the diagram, right click the diagram tab and then click **Close Diagram**.



Deleting Diagrams

When you delete a diagram, you only delete the diagram, not the elements represented on the diagram. However, if the diagram contains view elements specific for that diagram then the view elements are deleted with the diagram. For example, the objects shown in a sequence diagram will be deleted when you delete the diagram. However, the classifiers represented by the objects will not be deleted.

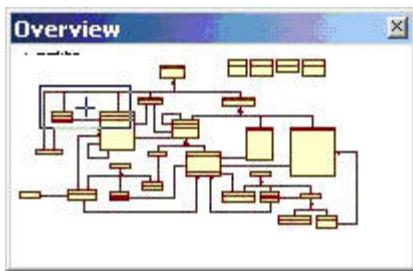
To delete a diagram, activate the diagram, then without selecting any element on the **Edit** menu click **Delete From Model**. As an alternative to delete a diagram, in the **Model Explorer** right click on the diagram and click **Delete From Model**.

5.1.2 Navigating Diagrams

When a diagram contains a lot of information, the diagram may become very large. Only a limited section of the diagram may be shown in the diagram area or you may not be able to see the details of the diagram. To find a specific part of your model quickly various ways of navigating the diagram are available.

First of all you can move the diagram around with the horizontal and vertical scrollbars. If your mouse has one, you can use the mouse wheel to scroll up and down. Hold down the Ctrl key and then click and hold in the diagram, then move the mouse to scroll horizontal and vertical through the diagram.

The **Overview** window contains the entire diagram in a small dialog. To open the **Overview** window, click and hold the Overview icon () in the lower right-hand corner of the diagram area. While holding the mouse button down, move the mouse around to move the screen to a specific part of the diagram.



To gain more overview of your diagram, you can zoom out. To see more detail or larger text, you can zoom in. The standard zoom level is 100%. At 100% zoom, the text is usually readable. If you increase the zoom level, the text will become bigger, but you will have less overview on the diagram.

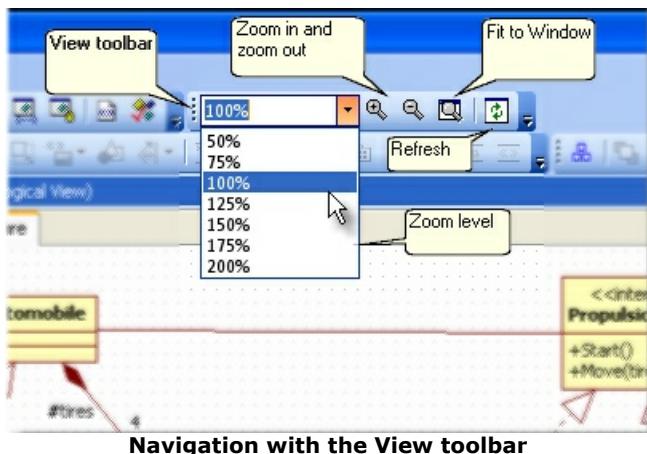
To zoom in, on the **View** menu point at **Zoom** and then click **Zoom In**. This will increase the zoom level by five percent.

To zoom out, on the **View** menu point at **Zoom** and then click **Zoom Out**. This will decrease the zoom level by five percent.

To zoom to a specific zoom level, on the View menu point at Zoom and then click the zoom percentage (50%, 75%, 100%, 125%, 150%, 175%, and 200%).

To gain an overview of the complete diagram, on the View menu point at Zoom and then click Fit to Window. The zoom level will depend on the size of your diagram and the size of the diagram area, however the zoom level will not go below 100%.

Use the **View** toolbar to navigate. To open the view toolbar, on the **View** menu point at **Toolbars** and then click **View**. The **View** toolbar is available when the View command is checked.



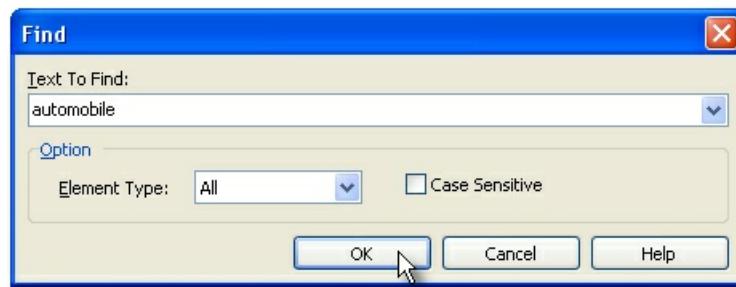
Navigation with the View toolbar

5.1.3 Finding Elements

When the project and thus the model grows, locating an element will become more difficult. Use the **Find** function to quickly find all diagrams in which an element name is used.

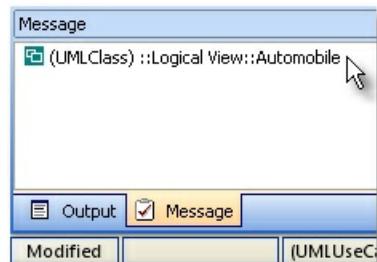
To find an element:

1. On the **Edit** menu, click **Find**.
2. In the **Find** dialog, enter the full or partial name of the element to find in the **Text to Find** box.
3. To limit the element types to find, select the element type from the **Element Type** list. To perform a case sensitive search, select the **Case Sensitive** checkbox.
4. Click **OK**. In the information message click **OK**.



Finding an element

5. The find results are listed in the **Messages** information area. Double-click a find result to go to the found element.



Find Results

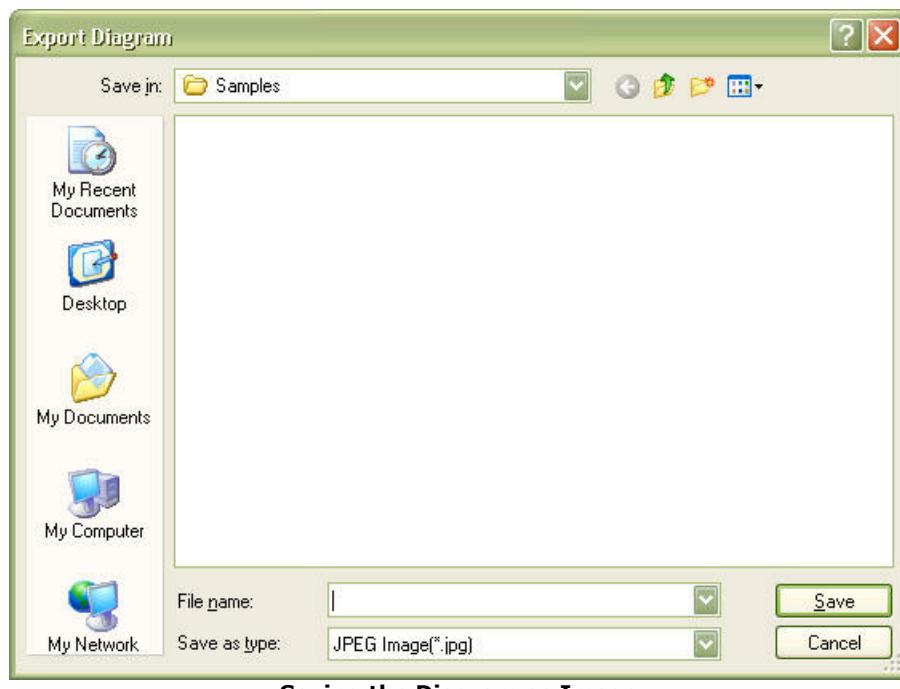
5.1.4 Diagrams as Image Files

Diagrams are part of documentation. You can use a diagram in documentation by creating an image from the diagram and importing the diagram in the document. In WhiteStarUML you can save diagrams in bitmap formats (JPEG (.jpg, .jpeg) and Windows bitmap (.bmp)), and in vector graphics formats (Windows Metafile Format (.wmf), and

Enhanced Metfile Format (.emf).

To save a diagram as image file

1. Activate the diagram you want to save.
2. On the **File** menu click **Export Diagram**.
3. In the **Export Diagram** dialog, enter the file name and select the file format, then click **Save**.



Note: Some viewers may not correctly display the Windows Metafile Format (.wmf) files. It is recommended to use the Enhanced Metafile Format(.emf).

You can also copy the diagram to the clipboard to use the diagram in another application. You can copy the diagram to the clipboard as a vector graphic or as bitmap. If you copy the diagram to the clipboard as a vector graphic, you can copy a part of the diagram.

Notes:

- If you copy the diagram to the clipboard as a bitmap, the whole diagram is copied. To edit the image to the right size you should first save the diagram to an image file.
- The paste function depends on the application in which you want to paste the image. To past an image in an application that complies to Windows standards, on the **Edit** menu click **Paste** or press CTRL+V on the keyboard.

- Applications only accept file formats from the clipboard that they can process. For example, bitmap editors may not accept vector graphics.

To copy the whole diagram to another application through the clipboard

1. Activate the diagram you want to copy.
2. To copy the diagram as a bitmap, on the **Edit** menu click **Copy Diagram as Bitmap**.
To copy the diagram as a vector graphic, on the **Edit** menu click **Copy Diagram**.
3. Open the other application and paste the image.

To copy the a part of the diagram as a vector graphic through the clipboard

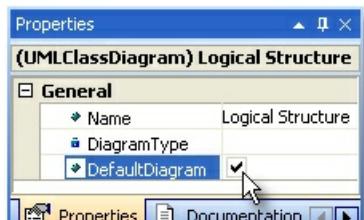
1. Activate the diagram you wan to copy.
2. Select the elements you want to copy.
3. On the **Edit** menu click **Copy**.
4. Open the other application and paste the image.

5.1.5 Setting the Default Diagram

A project can contain many diagrams. The default diagram is automatically opened when opening the project. For instance, you may want to set the diagram that expresses the overall structure of the project as the default diagram. Alternatively you may set the diagram that you want to continue with next time as the default diagram. Only Class Diagram, UseCase Diagram, Component Diagram or Deployment Diagram can be set as the default diagram.

To set a diagram as the default diagram

1. Activate the diagram you want to set as the default diagram.
2. Open the **Properties** sheet in the **Inspector** area.
3. In the property sheet, select the **DefaultDiagram** chekbox.



Set the Default Diagram

5.2 Managing Elements

There are two parts to an element in a diagram: the element in the model (model element) and the representation in the diagram (view element). Although you can create a model element without a view element, you cannot create a view element without a model element. What a model element looks like in a diagram is determined by the diagram the settings of the diagram and the use of the element in the diagram. For example, a classifier may be represented as a class in a class diagram or an object in a sequence diagram. An actor is also a classifier and can be shown in a sequence diagram, it is typically represented by a stick figure but can be represented by the box of an object. Those specifics are described in Working with Diagrams in the context of the diagram types.

This section discusses the tasks that apply to all view elements in a similar way.

There is no one correct way of creating elements. Which way you choose depends on your preference and the task at hand. If you start out with concepts, for example when analyzing a project initiation paper or an email that describes a project idea, then you may want to create the concepts as model elements first and figure out the details using diagrams later. On the other hand, if you have a sketch of a diagram on a napkin you may first want to create the diagram and later document the concepts.

5.2.1 Elements in Models

Creating Model Elements

To create model elements without a view element

1. In the **Model Explorer** navigate to the model and package where you want to create the model element.
2. Right click on a model or package, point at **Add** and select an element.
Alternatively, on the **Model** menu, point at Add and select an element.

The element is now created and you can edit the element's properties. Notice that you can create elements outside the context of a diagram such as classes and use case etc. These are the classifiers, which are visible in the model. Relationships are not directly visible in the model, but can be edited through the properties of the classifier or through the diagram.

Sorting in the Model

Models in the Model Explorer can be sorted in the order the elements were created (storage order) or alphabetical order. Changing the sorting order in the Model Explorer does not change the order in which the elements are saved.

To sort the elements in order of creation, click Storage Order () at the top of the Model Explorer.

To sort the elements in alphabetical order, click Alphabetical order () at the top of the Model Explorer.

Changing the Storage Order

The storage order of the model elements can be modified to group elements close to each other without using packages. The storage order of model elements can be changed only between the same kinds of elements. To change the storage order, first sort the elements in storage order as explained above.

To move an element up, select the element and then click Move Up () at the top of the Model Explorer.

To move an element down, select the element and then click Move Down () at the top of the Model Explorer.

Changing the Order of Collection Elements

You can change the order of elements which are shown in collection editors such as Attributes, Operations, Enumeration Literals.

To change the order of collection elements

1. Select the element that contains the collection you want to change.

2. On the **Model** menu select **Collection Editor**.

3. Open the tab of the collection you want to change.

4. Select an element and then

- to move the element up click Move Up () in the margin of the collection editor.

- to move the element down click Move Down () in the margin of the collection editor.

Deleting Model Elements

If you delete a model element, many related elements are deleted with the element. Please exercise caution because deleting a model element results in deletion of the following elements.

- Included Elements. All model elements included in a model or package that is to be deleted.
- Relationships: All relationships such as generalization, association or dependency for which the model element is an endpoint.
- View Elements: All view elements that represent the model being deleted from any diagram.

To delete a model element

- In the **Model Explorer** select the model element you wish to delete, then right click the element and select **Delete from Model**.
- In the diagram select the element you wish to delete, then right click the element point to **Edit** and select **Delete from Model**.
- In the diagram or in the **Model Explorer** select the model element you wish to delete, then on the **Edit** menu select **Delete from Model**.

5.2.1.1 Changing Properties

Setting Properties

Model elements contain various properties. You edit the properties in the properties editor. Although each element type can have different properties, there are four basic property types: String, Editor dialog, Drop down list box and Collection editor properties.

The following table describes the most general properties. For specific properties, see also Working with Diagrams

Property	Type	Description
Name	String	Indicates the name of the model element.
Stereotype	Editor dialog	Indicates the stereotype of the model element.
Visibility	Drop down list box	Indicates the visibility to the outside world of the model element.
Attributes, Operations, Relations and other collections	Collection editor	Indicates multiple elements, these are editable through the collection editor

Editing the Name

String type properties allow entering alphanumeric text, although restrictions on the characters you can use may exist.

To edit the name of a model element, in the property editor, enter a string value in the **Name** box. Names cannot contain colon characters (':'). Names must be unique within the namespace. For example, names of the classes within a package must all be unique.

Editing the Stereotype

Editor dialogs help you enter a value for the property. Many different editor dialogs exist, you open the editor dialog by clicking  in the property box.

To edit the stereotype of a model element, in the property editor, click  in the **Stereotype** box. In the **Select Stereotype** dialog do one of the following

- Select an existing name from the **Stereotype** list.
- Type a name in the **Stereotypes** box. The name can contain any alphanumeric character. The autocomplete function will suggest a matching stereotype that is pre-defined in one of the profiles used in the project. If the name exists in one of the profiles, then a reference will be created to the existing stereotype. An undefined stereotype will be saved only with the current model element.

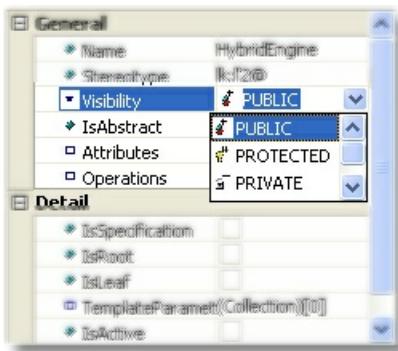
When you completed the stereotype name, click **OK**.

Editing Visibility

A drop down list box presents the available value from which you can choose.

The UML defines four values for visibility: Private, Protected, Package and Public. The default value, if you select no specific visibility, is Public.

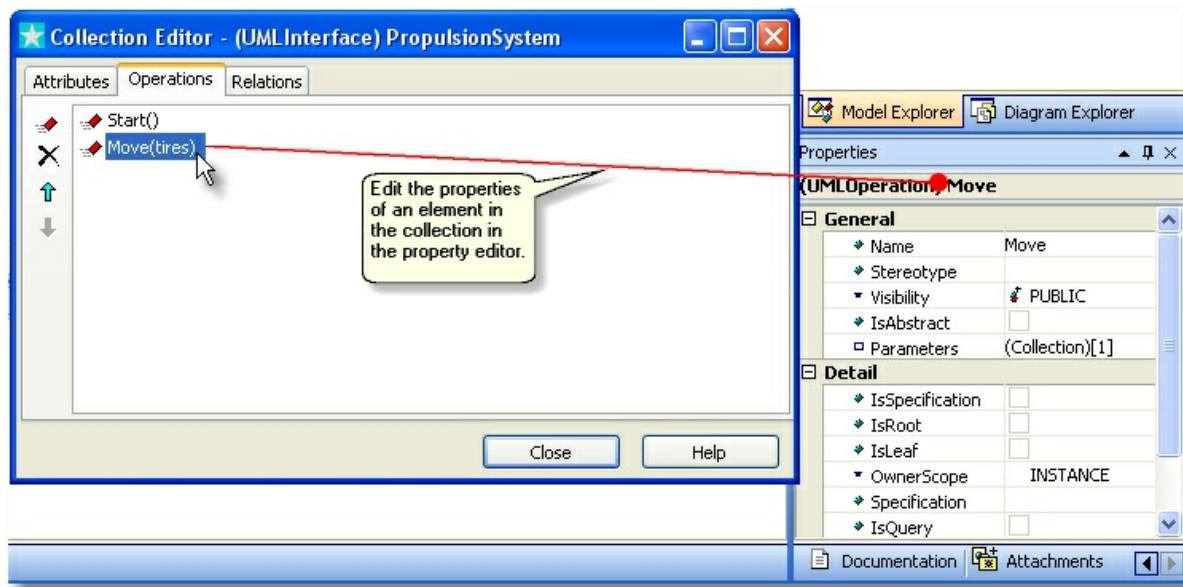
To edit visibility, in the property editor, open the list in the **Visibility** box and select a value. Scroll through the list to find a value if necessary.



Drop Down List for Visibility Property

Editing Collections

The collections editor is a specialized editor dialog. In the collections editor you will find all collections pertaining to the model element you selected. For example, if you edit the Attributes of a class element, you will also see the Operations and Relations of the element too. The collections editor is also different in that you edit the values of the collection element in the properties editor.



Collection Editor for an Interface Element

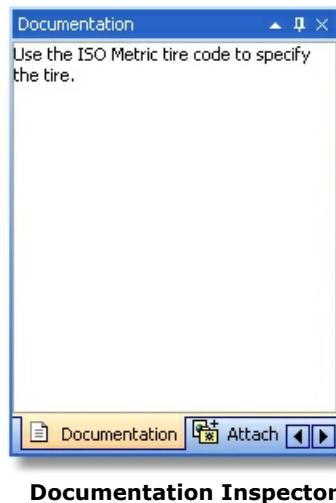
To edit the collection of an element, in the property editor, click in the collection's box. Alternatively, you can select the element in the diagram and then on the **Model** menu select **Collection Editor**.

5.2.1.2 Documenting Elements

Documentation is very important for capturing thoughts, development notes, description of the element and other information. The documentation of an element can be used when generating paper documentation, this way you will automatically have the diagrams and the notes together.

To add documentation to a model element:

1. In the **Model Explorer** or the diagram, select an element.
2. In the inspector area, open the **Documentation** tab.
3. Enter your documentation in the text box.

**Documentation Inspector**

5.2.1.3 Adding Attachments to Elements

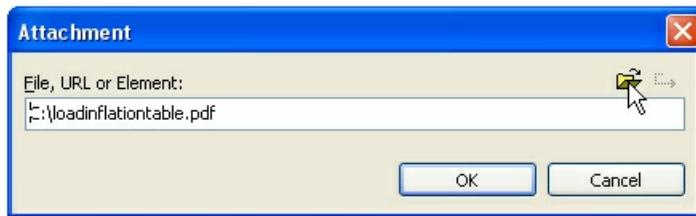
Attach related files or web page URLs to elements for extra documentation. You can easily access the attached files or web pages from within WhiteStarUml.

To attach a file

1. In the Model Explorer, select an element.
2. In the inspector area, open the **Attachments** tab.

**Attachments**

3. Click .
4. In the Attachment dialog, enter the full pathname and filename of the attachment file or the web page URL (or click the browse button on the right to select from the browse window), and click the [OK] button.



Attachment Dialog

To open the attachment, select the attachment and click .

To modify the attachment, select the attachment and click .

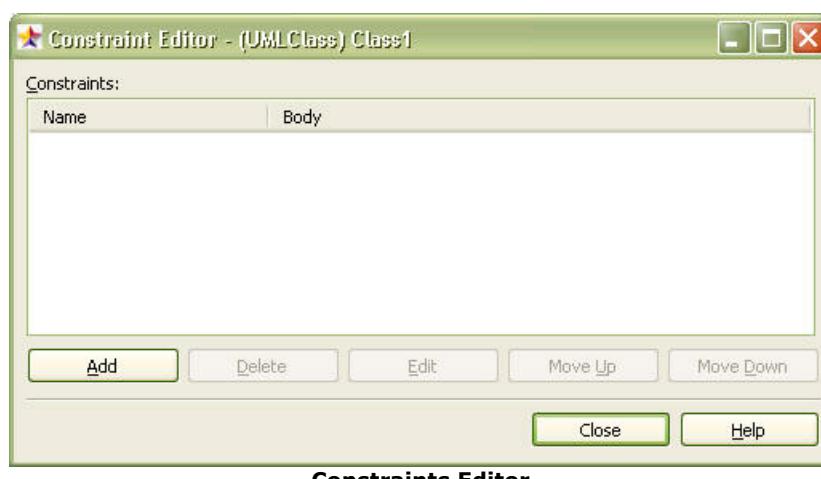
To delete the attachment, select the attachment and click .

5.2.1.4 Editing Constraints

Constraints are rules applied to an element. You can create multiple constraints for an element. You use either informal language, or you use a formal language such as OCL (Object Constraint Language) defined in the UML.

To add a constraint to a model element

1. In the **Model Explorer** or in the diagram, select an element.
2. On the **Model** menu click **Constraints**.
3. In the **Constraint Editor**, click the **Add**.



Constraints Editor

4. Enter the name and the body of the constraint.



5. When finished, click **OK**.

To edit a constraint

1. In the **Model Explorer** or the diagram, select an element.
2. On the **Model** menu click **Constraints**.
3. In the **Constraints Editor**, select the constraint to edit and click **Edit**
4. In the **Constraint** dialog, edit the name and body of the constraint.
5. When finished, click **OK**.

To remove a constraint

1. In the **Model Explorer** or the diagram, select an element.
2. On the **Model** menu click **Constraints**.
3. In the **Constraints Editor**, select the constraint to delete and click **Delete**.

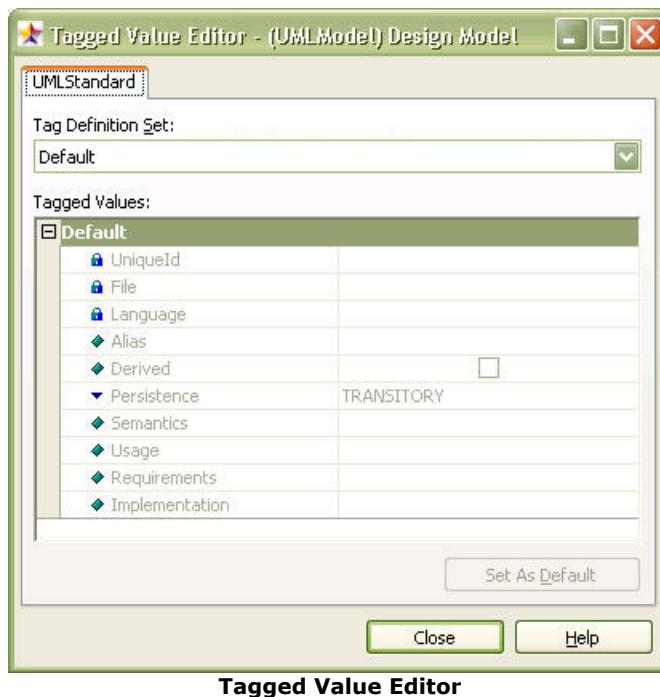
5.2.1.5 Editing Tagged Values

Besides the basic properties, elements can have tagged values. The UML profiles that are loaded in the project determine which tagged values are available. Not all tagged values can be modified, some maybe used for integrations or reversed engineering.

To show tagged values in the diagram, see Showing Properties.

To edit a tagged value

1. In the **Model Explorer** or the diagram, select an element.
2. On the **Model** menu click **Tagged Values**.
3. In the **Tagged Value Editor** dialog, select the tab that corresponds to the profile that contains the tagged value to edit.



4. From the **Tag Definition Set** select the set that contains the tagged value.
5. In the **Tagged Values** list, select a value. If the value can be edited the editor for the value will be enabled.
6. When finished, press **Tab** to move to the next value.

Notes:

- All elements, including relationships, attributes, operations and literals, have tagged values.
- To edit the tagged values of elements that are edited through a collection editor, you first select the element in the collection editor. For example, to edit the tagged value of attributes, open the attributes collection editor, select an attribute and then on the **Model** menu click **Tagged Values**.

5.2.1.6 Organizing Elements in the Model

A model consists of model elements and diagrams. Grouping elements and diagrams for efficient

management is very important. WhiteStarUML supports three types of grouping elements (models, subsystems and packages).

The following table describes the grouping elements available in a model.

Grouping Element	Description
 Model	A model provides a view of the system for a specific purpose. For example, a model can express a specific aspect of the system (e.g. analysis aspect, design aspect, user aspect, etc.). The use of models is often prescribed by the development methodology.
 Subsystem	A subsystem groups the elements that specify a part of the complete system.
 Package	Package logically groups and manages model elements. It is an extremely generalized element that can be used in any way for organizing elements.

Moving Model Element

You can move model elements to improve the organization of the model. Model elements can be moved to other elements that can contain the selected model element. For example, a class can be moved from one package to another or to another model or subsystem. You cannot move a class to an interface.

To move a model element

1. In the Model Explorer, select a model element.
2. Drag and drop the element on the destination element.

When the pointer changes to  , you can drop the element. When the pointer changes to  , you cannot drop the element.

To change the order of elements of the same kind, see [Changing the Storage Order](#).

5.2.2 Elements in Diagrams

Creating View Elements

View elements may represent classifiers from the model or details of the classifiers such as relationships. You can create a view element in two ways.

- From the toolbox. The toolbox contains all elements specifically available for the open diagram. The types of available elements vary from one diagram type to another. However, you may be able to use more model elements in the diagram. For example, an actor can be used in a sequence diagram but is not shown in the toolbox. From the toolbox you can create classifier elements and relationships. When you create a new element from the toolbox, the

application creates a model element in the model and a corresponding view element in the diagram.

- From the Model Explorer. Model elements may have different meaning in different types of diagrams, but you can use many elements in different diagrams. For example, you can use an actor in a use case diagram, a sequence diagram or a class diagram. However you can use a use case in a use case diagram only.

 **Note:** To learn more about how model elements can be used in different diagrams, see Copy and Paste Elements.

To create a new classifier element from the toolbox

1. Select a classifier element type in the toolbox.
2. Click at a location in the diagram or drag the mouse to specify the size of the new element.

To create a relationship between two classifiers

1. Select a relationship type from the palette
2. Drag from one classifier to the classifier that must be related.

 **Note:** The choice of the classifier you use to start the relationship and the classifier to end the relationship is important. For example in a class diagram, when you create a generalization you drag from the generalized class to the specialized class.

To create multiple elements of the same type

1. Double-click the element type in the toolbox. The element type is shown on a green background.
2. Create multiple elements.
3. Select another element type in the toolbox when finished.

Besides creating a new element in the diagram from the toolbox, you can also create view elements from the model. You can only drag elements to the diagram if that element type is appropriate for the diagram. For example, you can drag a class element to a class diagram or a sequence diagram but not to an activity diagram.

To add a classifier element to the diagram from the model

1. In the **Model Explorer** select the classifier element you want to place on the diagram.
2. Drag the classifier element to the diagram. If the classifier element has relationships to other classifiers already available on the diagram, then the diagram will show those relationships.

Editing Elements in the Diagram

Elements can directly be edited in the diagram area using the quick dialog. In the quick dialog you can edit more than just the name of the element. To learn more about the possibilities of quick dialogs, see Quick dialogs.

To open the quick dialog of a view element, double click the view element. Press Enter to finish editing and close the quick dialog.

Deleting View Element

When you delete a view element from a diagram, you do not delete the model element it represents.

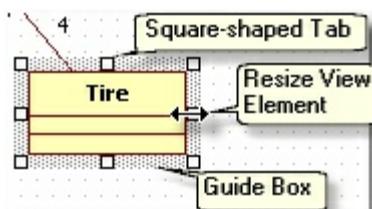
To delete a view element, select the view element and then press the **Delete** key on the keyboard, or on the **Edit** menu select **Delete**.

5.2.2.1 Resizing and Moving Elements

You can change the view element's size or position in the diagram. Using the keyboard you can change the size and position in very small steps.

To resize a view element

1. Select a view element in the diagram. A guide box will appear around the view element.



Resizing a View Element

2. Drag a square-shaped tab on the guide box.

To move a view element

1. Select a view element in the diagram. A guide box will appear around the view element.
2. Position the mouse in the center of the guide box and drag the view element.

To move an element using the keyboard, select a view element then hold down the Shift key and press an arrow key in the direction you want to move the view element. Using the Shift key with the arrow keys, you move the view element one grid unit at the time. To move the view element one pixel, select a view element then hold down Shift+Alt and press an arrow key in the direction you want to move the view element.

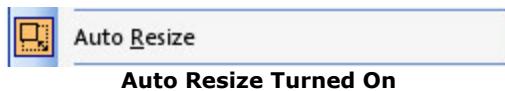
To move multiple view elements you first select the individual view elements and then

move the guide box. To select multiple view elements, first select one element then hold down the Shift key and select additional view elements.

Automatic Resize

A view element can also resize automatically to the size of its content. Auto resize will change the size of the view element each time you change the element's name, stereotype, attribute definition or operation definition. You can set auto resize for each individual view element.

To turn on auto resize of a view element, select the view element and then on the **Format** menu click **Auto Resize**. **Auto Resize** will now be checked.



To turn auto resize off, select the view element and uncheck **Auto Resize**.

5.2.2.2 Copy and Paste Elements

You can copy and paste view elements within the same diagram or to a different diagram. Copied view elements can be pasted in diagrams only; they cannot be pasted to model elements.

If you copy and past a view element within the same diagram, then the pasted view element will be related to the same model element as the original view element. This means that if you change the attributes of the model element, the changes will be reflected in both the original view element and in the copy.

To copy and past a view element

1. In the diagram select a view element
2. On the **Edit** menu click **Copy**.
3. Open or activate a diagram where you want to paste the view element.
4. On the **Edit** menu click **Paste**.

If you copy a view element to another diagram of the same type, then the copy will be the same type of element. Depending on the type of diagram and the model element behind the original, the copy may have a different notation. You can copy view elements to diagrams of another type. The following table describes the possibilites of copy and pasting between diagram types.

Diagram Type	Copy and Paste
Class Diagram	
UseCase Diagram	
Component Diagram	Elements can be copied or pasted freely between Class, UseCase, Component, CompositeStructure, and Deployment diagrams.
CompositeStructure Diagram	
Deployment Diagram	
Statechart Diagram	Elements can be copied between diagrams of the same StateMachine
Activity Diagram	Elements can be copied between diagrams of the same ActivityGraph
Sequence Diagrams	
Collaboration Diagrams	Elements cannot be copied or pasted

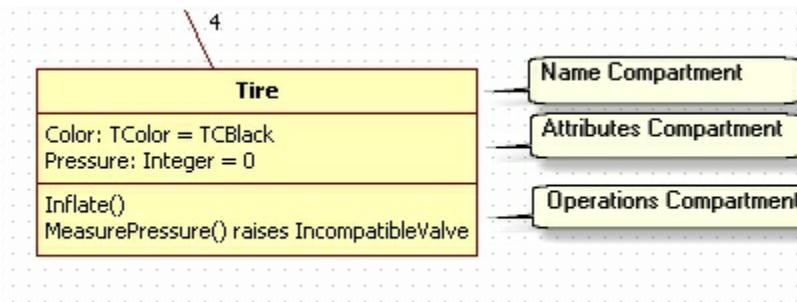
5.2.2.3 Formatting View Elements Compartments

The definition of how elements are shown in a diagram is called the notation in UML. The notation of diagrams may be different from UML tool to UML tool and even within the UML tool different notation may be defined. For example, the UML 1.1 notation is different from the UML 2.5 notation. In WhiteStarUml the notation is applied is defined in the profile. The profile may define special notations for stereotypes defined in the profile.

The generic notation of a class is a box. However, UML diagrams are intended to be very flexible and can provide different notations for elements to allow for personal preferences. WhiteStarUml supports this flexibility. You can change the appearance of a view element in detail.

Compartments

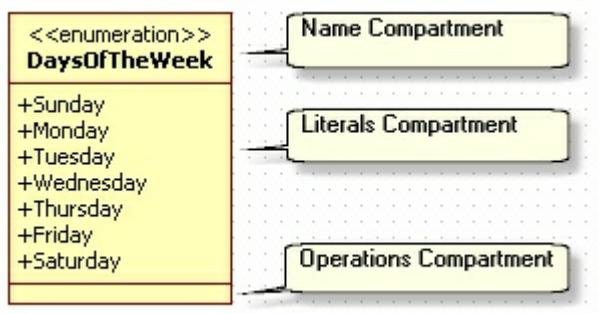
The notation of a classifier (Class, Actor, UseCase Exception etc.) consists of compartments. Classifiers have a name compartment, an attributes compartment and an operations compartment. Actors and Use Cases have the same compartments but are often not shown.



Classifier Compartments

Enumerations are data types you can define in the model. Enumeration defined the values that a variable of the enumeration's type can have as literals. In a class diagram, enumerations look like classes with an enumeration stereotype. However, enumeration

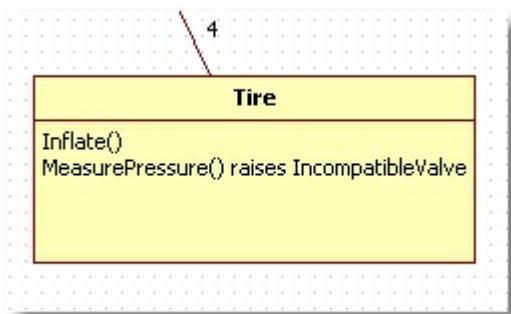
have a literals compartment and no attributes compartment.



Enumeration Compartments

You can hide the different compartments to focus the attention to the overall structure in the diagram.

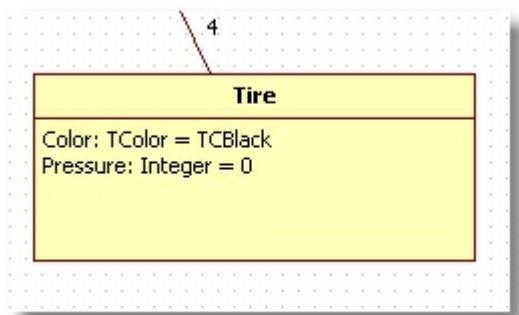
To suppress (hide) the attributes compartment, select the view element and on the **Format** menu click **Suppress Attributes**. **Suppress Attributes** will now be checked. To show the attributes compartment again, uncheck **Suppress Attributes**.



Suppressed Attributes



To suppress (hide) the operations compartment, select the view element and on the **Format** menu click **Suppress Operations**. **Suppress Operations** will now be checked. To show the operations compartment again, uncheck **Suppress Operations**.

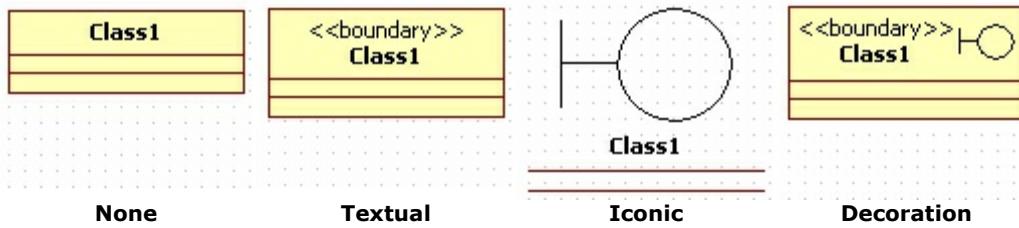
**Suppressed Operations**

To suppress (hide) the literals compartment of an enumeration, select the enumeration and on the **Format** menu click **Suppress Literals**. **Suppress Literals** will now be checked. To show the literals compartment again, uncheck **Suppress Literals**.

**Formatting the Name Compartment****Stereotype**

The stereotype of a classifier gives a general idea of what the element represents. Often the stereotype provides implementation details. The icon notation of a stereotype is defined in the profile that is loaded in the project. The default display format for a classifier's view element is the textual display format.

To change the display of the stereotype select an element, on the **Format** menu point at **Stereotype Display** and then select a format.

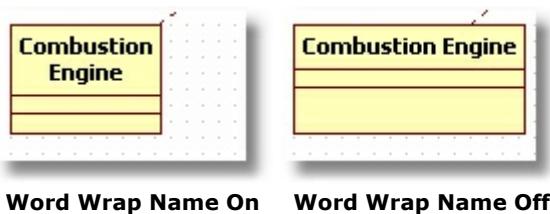


- **None:** Hides the stereotype from the name compartment.
- **Textual:** Stereotype name is shown between double angle quotation marks ("`<<boundary>>`").
- **Iconic:** The notation of the view element is changed to the stereotype icon. An icon must be defined for the stereotype in one of the loaded profiles for an icon to show. If no icon is defined, the textual format is displayed. Some classifiers (such as Actor, Interface, Component, Node and Artifact) are shown in decoration type format if no icon is defined for the stereotype.
- **Decoration:** The stereotype is shown in textual format together with a small. An icon must be defined for the stereotype in one of the loaded profiles for an icon to show. If no icon is defined, the textual format is displayed.

Applying Word Wrap

When an element name consists of two or more words, the name may become too wide compared to the attributes and operations. You can use word wrap to improve the element's appearance.

To turn on word wrap, select the element, on the Format menu click Word Wrap Name. Word Wrap Name will now be checked. To turn off word wrap, uncheck Word Wrap Name.



Note: Some elements such as relative elements, unexpressed elements on a diagram and Swimlane cannot apply Word Wrap.

Showing the Parent Name

In general, view elements show their own names only. However, a project containing multiple packages may have elements with the same names in different packages. You may need to show elements with the same name in one diagram. In such a case, you can show the element's parent names in order to distinguish one from the other. The names are in the format "ParentName::OwnName."

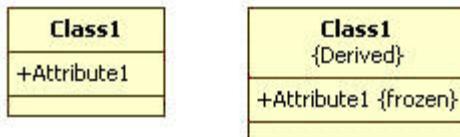


To show the parent name, select the view element and on the **Format** menu click **Show Parent Name**. **Show Parent Name** will now be checked. To hide the parent name, select the view element and uncheck **Show Parent Name**.

Formatting the Attributes, Operations and Literals Compartments

Detail Properties

Some properties are in text between curly braces ("{...}"), they are not expressed graphically. For attributes these detail properties are the tagged values and the changeability properties. For relationships these detail properties are the tagged values, changeability and ordering properties.



To show the tagged values and changeability properties of attributes, select an element in the **Model Explorer** or in the diagram, then on the **Format** menu click **Show Properties**. **Show Properties** will now be checked. To hide the properties, select the element and uncheck **Show Properties**.

To show the tagged values, changeability and ordering properties of relationships, select a relationship in the diagram, then on the **Format** menu click **Show Properties**. **Show Properties** will now be checked. To hide the properties, select the relationship and uncheck **Show Properties**.

Notes:

- The default value of the changeability property (CHANGEABLE) is never shown.
- The default value of the ordering property (UNORDERED) is never shown.
- Tagged values are only shown when the tagged values are initialized. To initialize the tagged values of an element, select the element and then on the **Model** menu click **Tagged Values**.

Operation Signature

You can show or hide the parameters and parameter types of operations. The parameter

details of an operation form the signature of that operation.

To show operation signatures, select an element in the **Model Explorer** or in the diagram, then on the **Format** menu click **Show Operation Signature**. **Show Signature** will now be checked. To hide the operation signatures, select the element and uncheck **Show Signatures**.

Visibility of Compartment Elements

To show the visibility symbols of attributes, operations and literals, select an element in the **Model Explorer** or in the diagram and then on the **Format** menu click **Show Compartment Visibility**. **Show Compartment Visibility** is now checked. To hide the visibility symbols of attributes, operations and literals, select the element and uncheck **Show Compartment Visibility**.

Stereotypes of Compartment Elements

To show the stereotypes of attributes, operations and literals, select a view element and on the **Format** menu click **Show Compartment Stereotypes**. **Show Compartment Stereotypes** will now be checked. To hide the stereotypes, select the view element and uncheck **Show Compartment Stereotypes**.

5.2.2.4 Formatting View Element Appearance

The color used in UML diagrams can convey extra information. For example, Peter Coad, Eric Lefebvre, and Jeff De Luca in their book Java Modeling In Color With UML: Enterprise Components and Process proposed to use color to identify archetypes. They defined four archetypes that roughly model similar things across domains. Each of the archetypes has a specific color.

Other common use of color in UML diagrams are to identify the participants in a design pattern, or to identify the classes from different packages, or to simply emphasize a few classes in an illustration used in documentation.

In this topic the appearance of individual elements and relationships is discussed. To change the default appearance of new elements in diagrams, see General View Configuration.

To change the line color of a classifier

1. In the diagram, select an element.
2. On the **Format** menu, click **Line Color**.
3. In the **Color** dialog, select a color and click **OK**.



To change the fill color of a classifier

1. In the diagram, select an element.
2. On the **Format** menu, click **Fill Color**.
3. In the **Color** dialog, select a color and click **OK**.

To change the font style and color

1. In the diagram, select an element.
2. On the **Format** menu, click **Font**.
3. In the **Font** dialog, select style and color for the element and click **OK**.



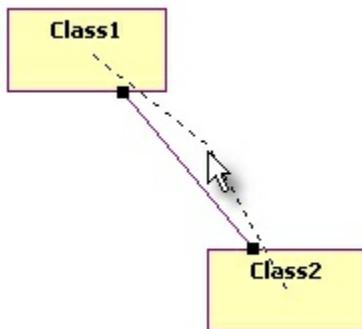
Note

- The font style for some view elements cannot be changed because some the font styles are defined by the UML conventions.

5.2.2.5 Changing Relationships and Line Styles

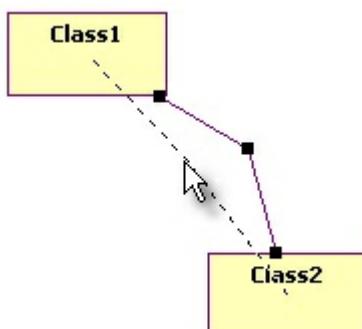
You can change the line style of relationships (associations, dependencies and generalization etc.) to keep your diagram clean. Sometimes a diagram may get crowded and changing and arranging the lines may help to avoid confusion.

When you create a relationship, the line will have one segment and will appear to go straight from the center of one classifier to the other. To create a new segment, click on the relationship and drag the line. A line with multiple segments will have square-shaped tabs where two segments meet and on each endpoint of the relationship.



Drag to Create New Segment

To remove a segment, select the relationship and then drag the square-shaped tab to the point that makes the dashed line straight.

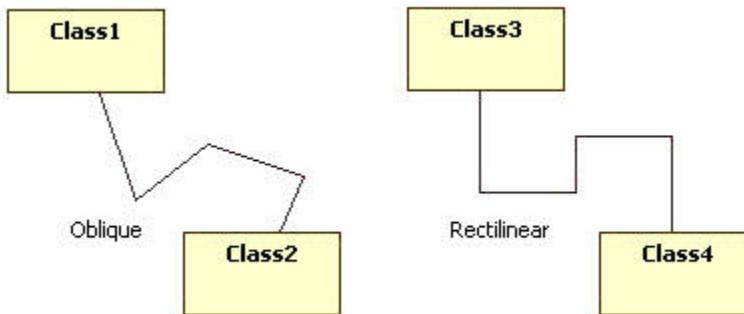


Drag to Remove Line Segment

You can show relationships in the following line styles:

- **Rectilinear**, ine segments meet in perpendicular angles.

- **Oblique**, line segments meet in any angle.

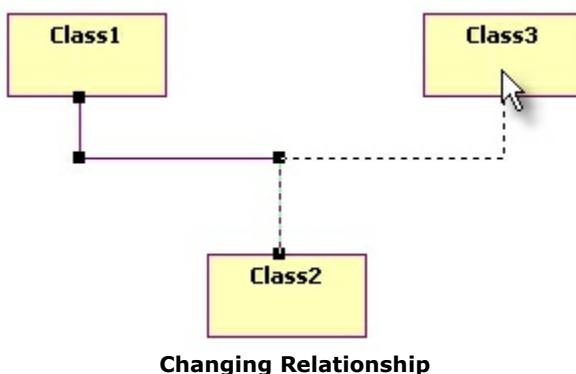


To change the line style from oblique to rectilinear

1. In the diagram, select a relationship.
2. On the **Format** menu, point to **Line Style** and click **Rectilinear**. **Rectilinear** will now be checked.

To change the route of the relationship, select the relationship and drag the square-shaped tab at the end points or between the line segments to a better place.

You can also change the relationship in the diagram. To change the relationship, drag the endpoint from one classifier to another classifier. The new classifier must be of a type that can part in the changed relationship. In the image below, the relationship is changed from a relationship between Class1 and Class2 to a relationship between Class3 and Class2.



To change the line color of a relationship

1. In the diagram, select a relationship.

2. On the **Format** menu, click **Line Color**.
3. In the **Color** dialog, select a color and click **OK**.



5.2.2.6 Laying Out Elements in a Diagram

The layout of a diagram can help emphasize the important parts of a diagram. For example by helper classes around a central class. Another form of layout may align classifiers to show levels or groups of classifiers that go together.

To align elements, select the elements you want to align and then on the **Format** menu point to **Alignment** and click the type of alignment. The following table shows the available types of alignment.

Align Function	Description
Align Left	Align the selected elements to the left side of the left most element.
Align Right	Align the selected elements to the right side of the right most element.
Align Middle	Center the selected elements horizontally to the middle between the left most and the right most element.
Align Top	Align the selected elements to the top of the top most element
Align Bottom	Align the selected elements to the bottom of the lowest element.
Align Center	Center the selected element vertically to the middle between the top most and the lowest element.
Space Equally, Horizontally	Evenly distribute the selected elements horizontally.
Space Equally, Vertically	Evenly distribute the selected elements vertically.

When working with a large number of view elements in a diagram, the elements may overlap. You can improve the situation by bringing the element you are working on to the front, the element is then over all other elements. To bring an element to the front, select the element in the diagram and then on the **Format** menu point to **Alignment** and click **Bring to Front**.

Align Function	Description
Bring to Front	Bring the selected elements to the front.
Send to Back	Send the selected elements to the back.

In case the diagram elements are laid out in a disorderly way, you may automatically lay out the diagram for tidier display. The automatic layout will organize the elements as follows:

- The elements will be placed closed to each other, starting in the upper left hand corner.
- The elements will not overlap.
- If there is a hierarchy, then the elements will be laid out in a tree structure with the root of the tree at the top.

To use the automatic layout, activate the diagram and then on the Format menu click Layout Diagram.

Note: The layout diagram function is not available for Sequence Diagram.

Chapter

6

6 Working with Diagrams

To work with the diagrams available in WhiteStarUml some understanding of UML is useful. However, the best way to learn UML is to use it in diagrams and talk about the diagrams. A diagram is finished if it makes sense and you can explain your thoughts to anyone who needs to know.

Each diagram has a specific set of elements. Elements have a meaning within the type of diagram, these are the semantics of the element. Understanding the semantics of the element will help you better express your thoughts in the diagram. The semantics are the basis of the conversation you will have about the diagram which is after all the purpose of the Unified Modeling Language.

Types of Diagrams Available

Diagram Type	Description
 Class Diagram	Class Diagram is a visual expression of various static relations of class-related elements. Class Diagram can contain not only classes but also interfaces, enumerations, packages, various relations, instances, and their links.
 Use Case Diagram	Use Case Diagram is an expression of relations between the use cases in a specific system or object and the external actors. Use Case expresses the functions of the system and how the system functions interact with the external actors.
 Sequence Diagram	Sequence Diagram expresses the interactions of instances. It is a direct expression of the InteractionInstanceSet, which is a set of the stimuli exchanged between the instances within a CollaborationInstanceSet. While Sequence Role Diagram is a ClassifierRole-oriented expression, Sequence Diagram is an Instance-oriented expression.
 Sequence Diagram (Role)	Sequence Role Diagram expresses the interactions of the role concepts. It is a direct expression of the Interaction, which is a set of the messages exchanged between the ClassifierRoles within a Collaboration. While Sequence Diagram is an Instance-oriented expression, Sequence Role Diagram is a ClassifierRole-oriented expression.
 Collaboration Diagram	Collaboration Diagram expresses the

	collaboration between instances. It is a direct expression of the collaboration model of the instances within a CollaborationInstanceSet. While Collaboration Role Diagram is a ClassifierRole-oriented expression, Collaboration Diagram is an Instance-oriented expression.
 Collaboration Diagram (Role)	Collaboration Role Diagram expresses the collaboration between the role concepts. It is a direct expression of the collaboration model of the ClassifierRoles within a Collaboration. While Collaboration Diagram is an Instance-oriented expression, Collaboration Role Diagram is a ClassifierRole-oriented expression.
 Statechart Diagram	Statechart Diagram expresses the static behaviors of a specific object through states and their transitions. Although Statechart Diagram is generally used to express the behaviors for instances of classes, it can also be used to express behaviors of other elements.
 Activity Diagram	Activity Diagram is a special form of Statechart Diagram that is suitable for expressing the activity execution flow. Activity Diagram is commonly used for expressing workflow, and it is frequently used for objects like classes, packages, and operations.
 Component Diagram	Component Diagram expresses the dependency between the software components. The elements that constitute software components and the elements that implement those components can all be expressed by Component Diagram.
 Deployment Diagram	Deployment Diagram expresses the hardware elements of the physical computer and devices and the software components, processes and objects that are assigned to them.
 Composite Structure Diagram	Composite Structure Diagram is a diagram to express internal structure of Classifier. It is included in interaction point with other parts of system.

Note

- The types of view elements available differ for each diagram.

6.1 UseCase Diagrams

The following elements are available in a usecase diagram.

- Actor
- UseCase
- Association
- Derected Association
- Generalization
- Dependency
- Include
- Extend
- System Boundary
- Package

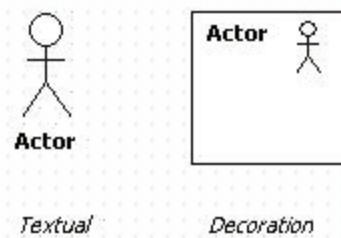
Actor

Semantics

An actor defines a coherent set of roles that users of an entity can play when interacting with the entity. An actor may be considered to play a separate role with regard to each use case with which it communicates.

Procedure for creating Actor

In order to create Actor, click **[Toolbox] -> [UseCase] -> [Actor]** button and click the position where to place Actor. Actor is shown in the form of stick man or rectangle with icon, that is decoration view. To display actor in decoration view, select **[Format] -> [Stereotype Display] -> [Decoration]** menu item or select **[Decoration]** item in  combo button on toolbar.



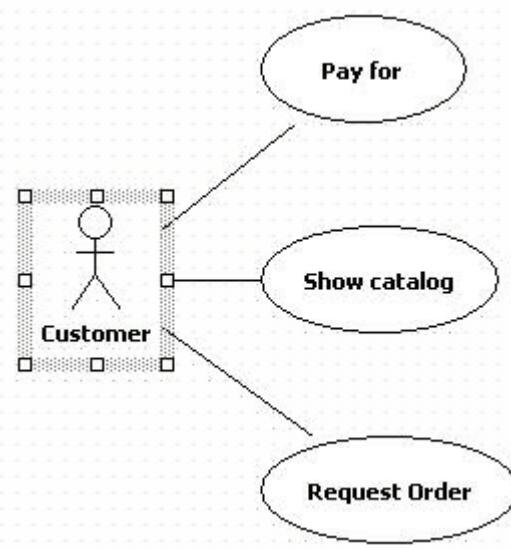
Procedure for creating multiple UseCases used by Actor at once

In order to create multiple UseCases related to Actor at once, use shortcut creation syntax of Actor.

1. At the Actor's quick dialog, enter UseCase's name after "-()" string. To create multiple UseCases, enter same but separate UseCase's name by "," character.



2. And press **[Enter]** key. Several UseCases associated with the Actor are created and arranged vertically.



UseCase

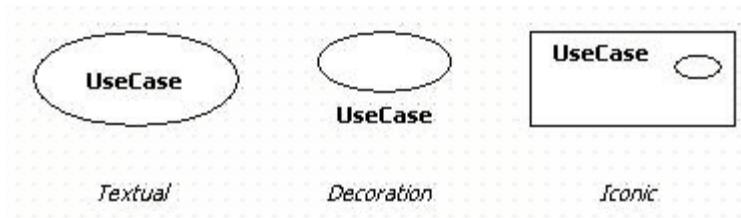
Semantics

The use case construct is used to define the behavior of a system or other semantic entity without revealing the entity's internal structure. Each use case specifies a sequence of actions, including variants, that the entity can perform, interacting with actors of the entity.

Procedure for creating UseCase

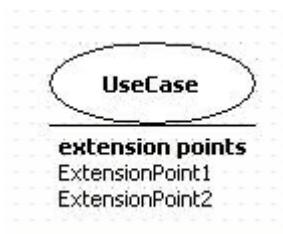
In order to create UseCase, click **[Toolbox]** -> **[UseCase]** button and click the position where to place UseCase on the **[main window]**.

UseCase is expressed in the forms of textual, decoration, iconic. To change UseCase's view style, select menu item under **[Format] -> [Stereotype Display]** or select  button's combo item.

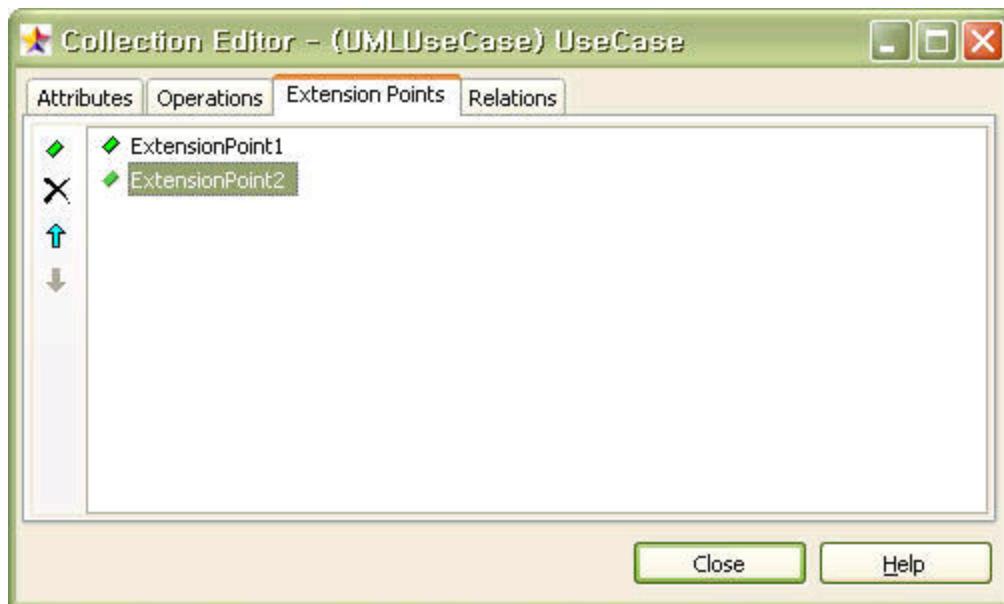


Procedure for adding Extension

An extension point references one or a collection of locations in a use case where the use case may be extended.

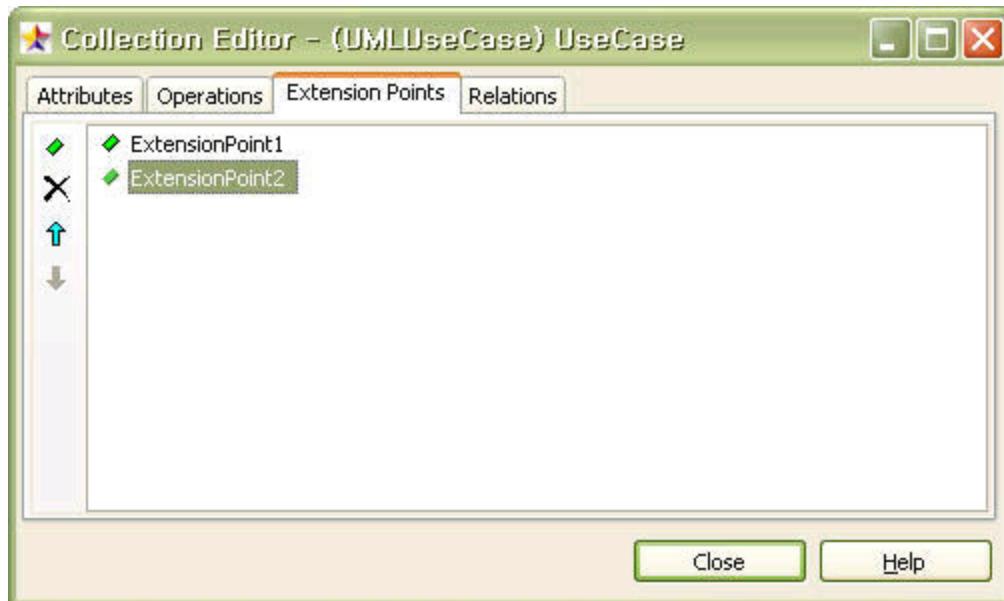


To edit ExtensionPoints of UseCase, click UseCase's **[Collection Editor...]** popup menu or click  button of **[ExtensionPoints]** collection property.



Procedure for entering UseCase specification

To enter basic flow, alternative flow properties of usecase, select [**Tagged Values...**] popup menu or click [**Ctrl+F7**] button. At tagged value editor, select [**UseCaseSpecification**] item and enter the properties.



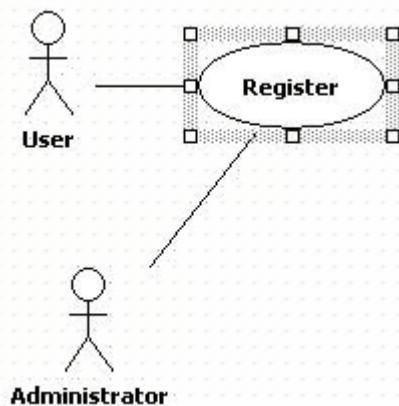
Procedure for creating Actor from UseCase

In order to create multiple Actors related to UseCase at once, use shortcut creation syntax.

1. Double-click UseCase, or select UseCase and press [**Enter**] key. At quick dialog, enter Actor's name after "()-" string and separate Actor names by "," character.



2. And press [**Enter**] key. Several Actors associated with the UseCase are created and arranged vertically.



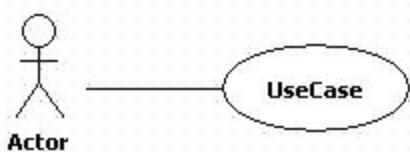
Association / Derected Association

Semantics

A association is an association among exactly two classifiers (including the possibility of an association from a classifier to itself).

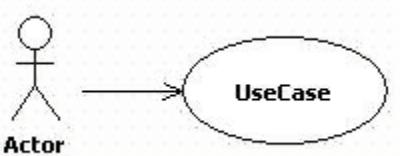
Procedure for creating association

In order to create association, click [**Toolbox**] -> [**UseCase**] -> [**Association**] button, drag from first element, and drop to second element in the [**main window**].

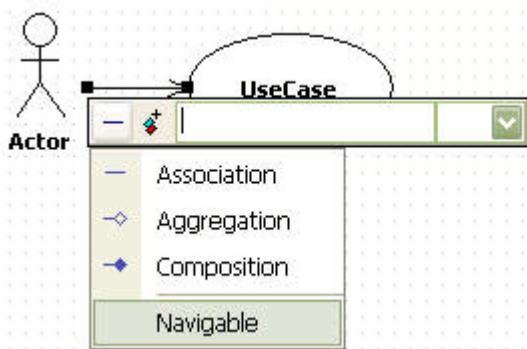


Procedure for creating directed association

The procedure is equal to the association's, drag and drop in the arrow direction.



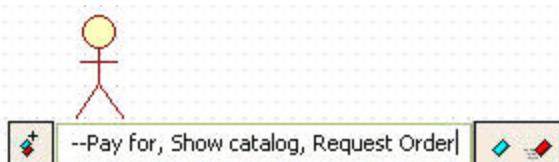
Or create association, click the actor-side association end. At the quick dialog, uncheck navigable and association becomes directed.



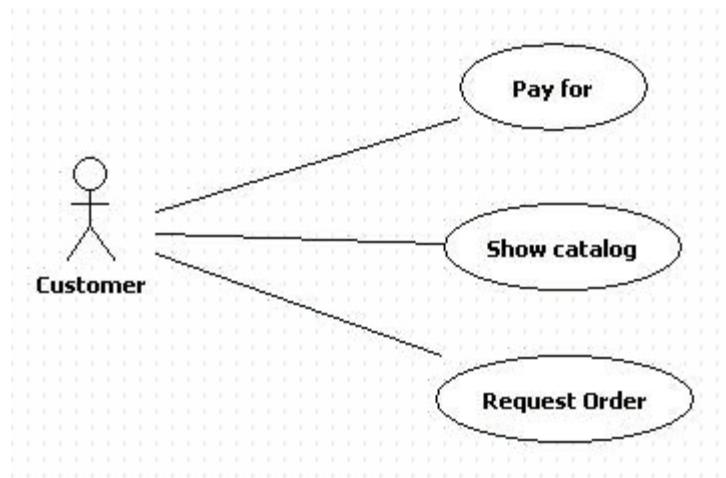
Procedure for creating element related to association/directed association

In order to create element associated with current element, use shortcut creation syntax.

1. Double-click element and enter element's names associated after "--" or "->" string at the quick dialog. Separate element names with "," character to relate multiple elements.



2. Press **[Enter]** key and several elements associated with selected element are created and arranged automatically.



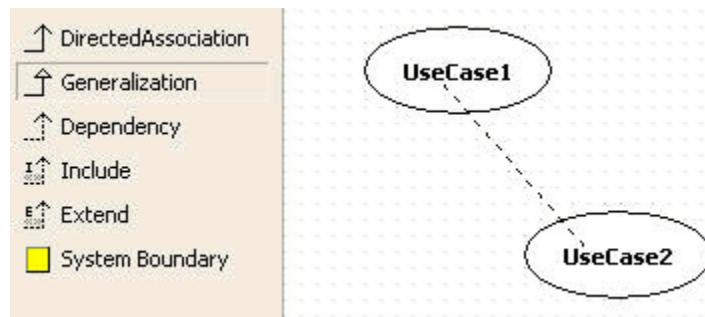
Generalization

Semantics

Generalization is the taxonomic relationship between a more general element (the parent) and a more specific element (the child) that is fully consistent with the first element and that adds additional information.

Procedure for creating generalization

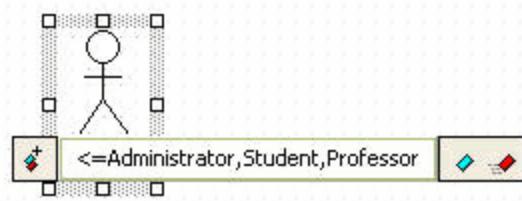
In order to make generalization, click **[Toolbox] -> [UseCase] ->[Generalization]** button, drag from child element and drop to parent element in the **[main window]**.



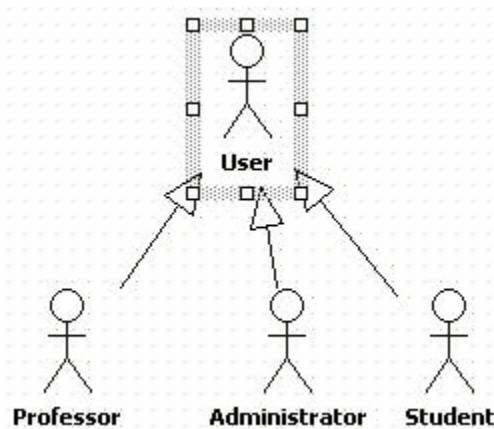
Procedure for creating multiple child actors inherited from actor

To create multiple elements inherited from some element,

1. Enter with "<=" string as following at the quick dialog, and several elements inherited from selected element are created at once.



2. Child elements are generated below selected element and arranged automatically.



If you want to create multiple parent element at once, enter ">=" string instead of "<=" in the quick dialog.

Dependency

Semantics

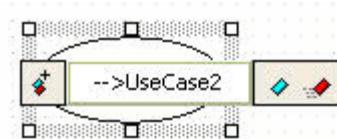
A *dependency* is a type of relationship that signifies that one element, or group of elements, acting as the client depends on another element or group of elements that act as a supplier. It is a weak relationship that denotes that if the supplier is changed the client may be affected. It is a unidirectional relationship.

Procedure for creating dependency

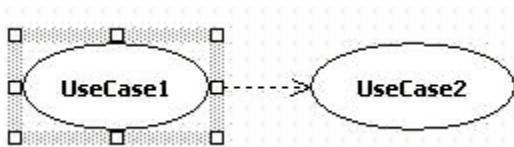
In order to create dependency, click **[Toolbox] -> [UseCase] -> [Dependency]** button, drag element and drop to other element depended.

Procedure for creating other usecase depended by current usecase

Enter with "-->" string at the quick dialog as following.



So dependency relationship is created between two elements.



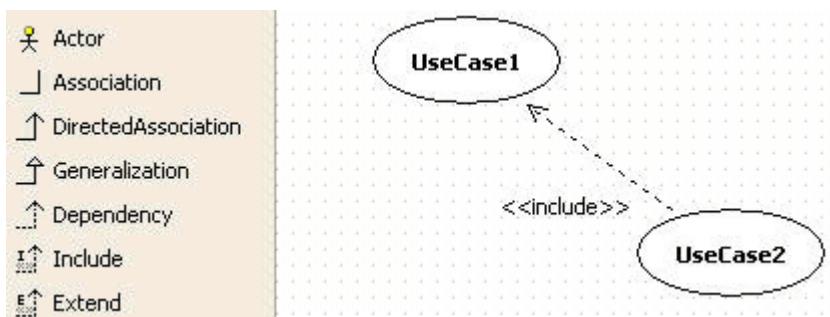
Include

Semantics

An include relationship defines that a use case contains the behavior defined in another use case.

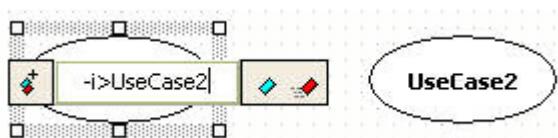
Procedure for creating include

In order to create include relationship, click **[Toolbox] -> [UseCase] -> [Include]** button, drag from element including and drop to element included in the **[main window]**.

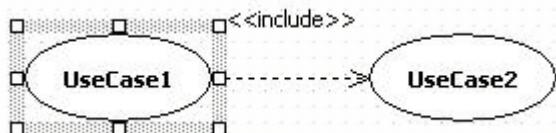


Procedure for creating other usecase included by current usecase

Enter with "-i>" string at the quick dialog as following.



So include relationship is created between two elements.



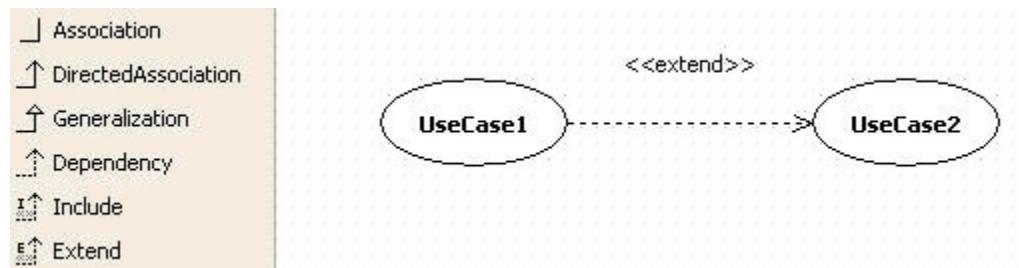
Extend

Semantics

An extend relationship defines that instances of a use case may be augmented with some additional behavior defined in an extending use case.

Procedure for creating extend

In order to create extend, click **[Toolbox]** -> **[UseCase]** -> **[Extend]** button, drag from element extending and drop to element extended in the **[main window]**.

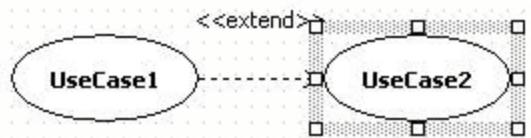


Procedure for creating other usecase extending current usecase

Enter with "<e-" string at the quick dialog as following.



So extend relationship is created between two elements.



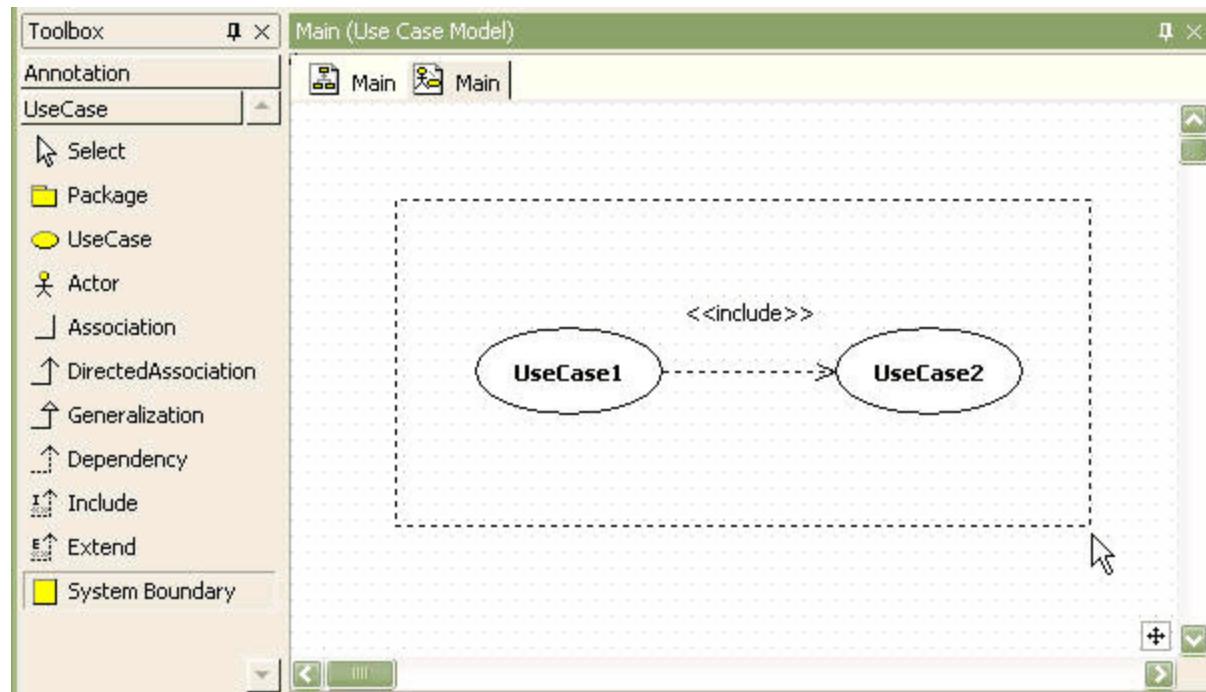
System Boundary

Semantics

A *System Boundary* is a type of partition that represents the boundary between the thing you are representing with the use cases (inside the boundary) and the actors (outside the boundary). Its most typical usage is the boundary of an entire system. Use cases can be used to represent subsystems and classes and so the boundary may be more specific than an entire system. A package with a stereotype *topLevel* can be used as a boundary and name space within the use case model to denote the same thing as the *use case boundary*.

Procedure for creating system boundary

In order to create system boundary, click [**Toolbox**] -> [**UseCase**] -> [**System Boundary**] button, drag from the starting point of system boundary and drag to right-bottom point of system boundary.



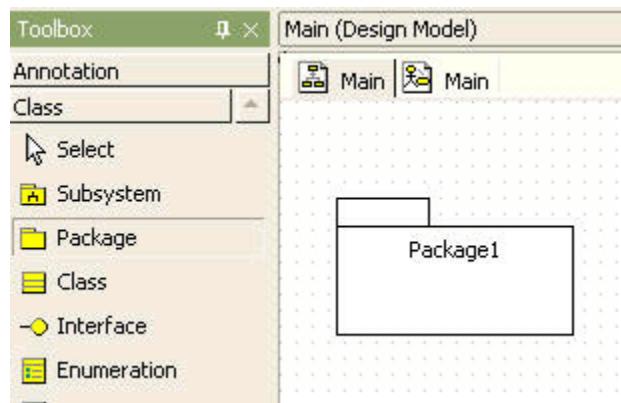
Package

Semantics

A package is a grouping of model elements. Packages themselves may be nested within other packages. A package may contain subordinate packages as well as other kinds of model elements. All kinds of UML model elements can be organized into packages.

Procedure for creating package

In order to create package, click **[Toolbox]** -> **[UseCase]** -> **[Package]** button and click at the location where package will be placed in the **[main window]**.



6.2 Class Diagrams

The following elements are available in the class diagram.

- Subsystem
- Package
- Class
- Interface
- Enumeration
- Signal
- Exception
- Port
- Part

- Association
- Directed Association
- Aggregate
- Composite
- Generalization
- Dependency
- Realization
- Association Class
- Object
- Link
- Relationship

Subsystem

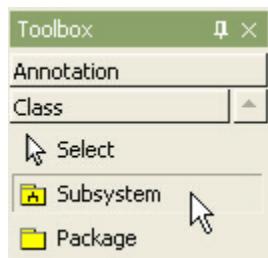
Semantics

Whereas a package is a generic mechanism for organizing model elements, a subsystem represents a behavioral unit in the physical system, and hence in the model.

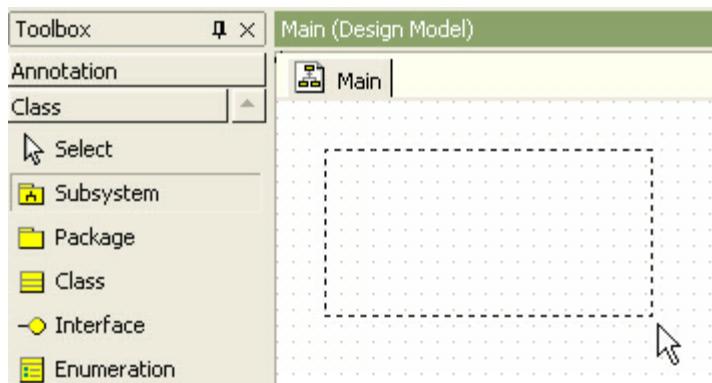
Procedure for creating subsystem

In order to create subsystem,

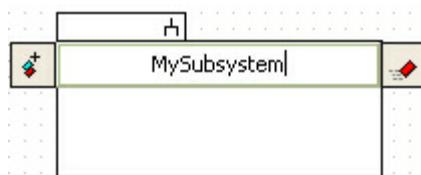
1. Click **[Toolbox] -> [Class] -> [Subsystem]** button.



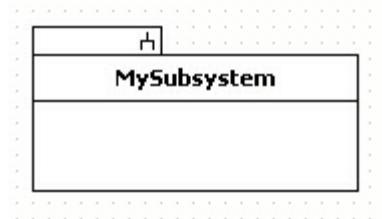
2. And click at the location or boundary where subsystem will be placed in the **[main window]**.



3. Then a subsystem is created on the class diagram and subsystem quick dialog is opened. At the quick dialog, enter the subsystem name.



4. And press [Enter] key to have done this procedure.



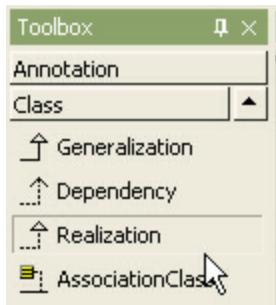
Procedure for creating providing interface of subsystem.

In order to providing interface of subsystem,

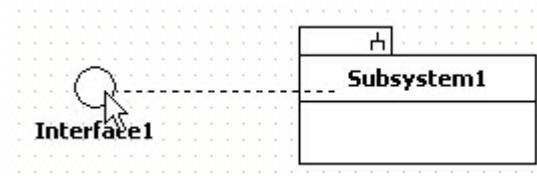
1. Create interface and susbsystem.



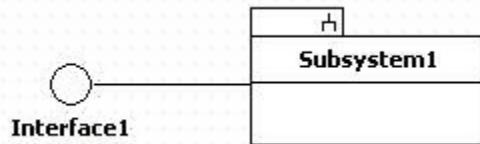
2. Click [Toolbox] -> [Realization] button.



3. Drag from subsystem and drop to interface.

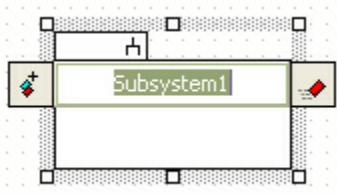


4. Between interface and subsystem, providing interface relationship is created finally.

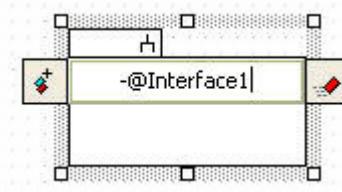


In order to create interface and realization at once,

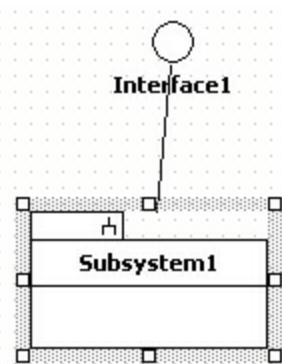
1. Double-click subsystem and subsystem quick dialog is opened.



2. Enter text in the quick dialog as following



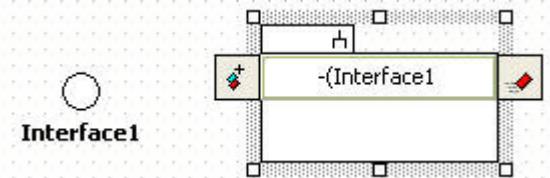
3. Press [Enter] key and interface provided by subsystem is created .



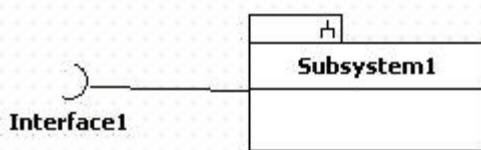
Procedure for creating requiring interface

In order to create requiring interface, use shortcut creation syntax.

1. Double-click subsystem. At the quick dialog, enter text as follows.



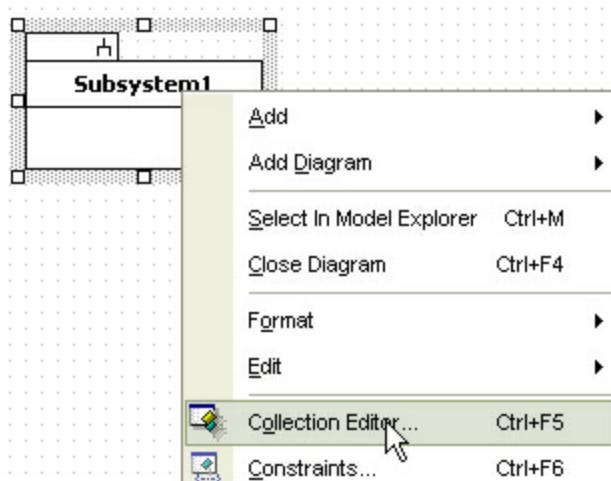
2. Then subsystem connects to interface as requiring relationship.



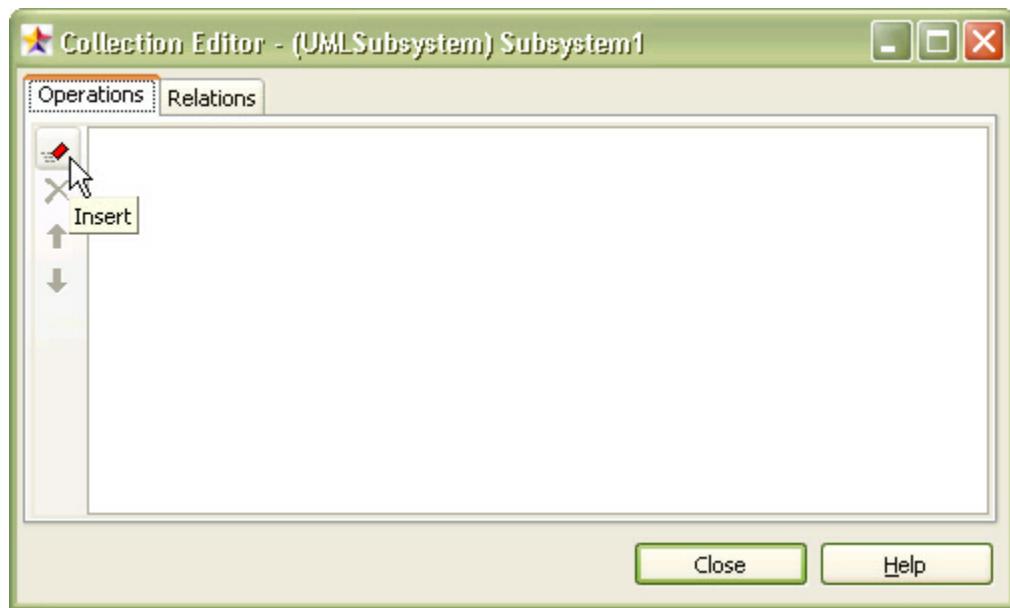
Procedure for adding operation to subsystem

Subsystem can have operation. In order to add operation to subsystem,

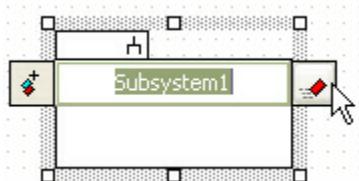
1. Select **[Collection Editor...]** popup menu.



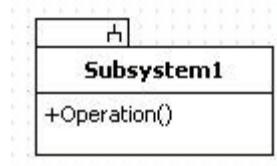
2. At the [collection editor], add operation on the [operations] tab.



3. Or click button at the quick dialog of subsystem.



4. Then a new operation is created.



Class

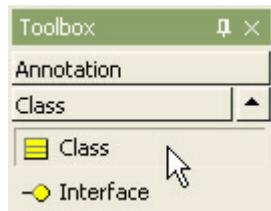
Semantics

A class is the descriptor for a set of objects with similar structure, behavior, and relationships.

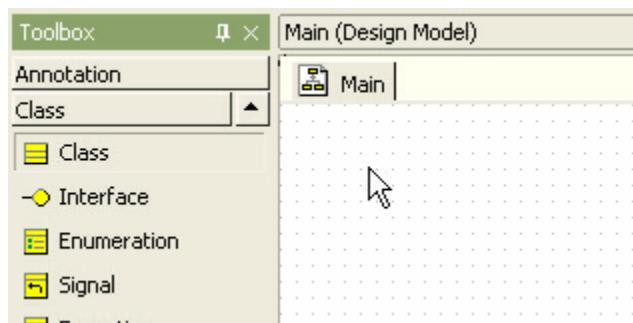
Procedure for creating class

In order to create class,

1. Click **[Toolbox] -> [Class] -> [Class]** button.

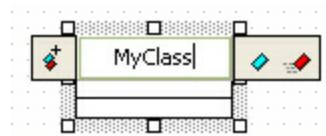


2. And click at the position where class will be placed in the [main window].



3. A new class is created on the diagram and class quick dialog is opened.

4. At the quick dialog, enter the class name and press **[Enter]** key.



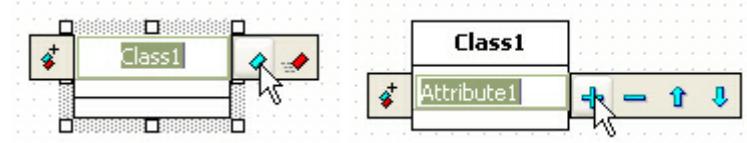
Procedure for adding attribute

There are three method to add attribute to class.

- using quick dialog
- using model in the **[main window]** or the **[model explorer]**
- using **[collection editor]**

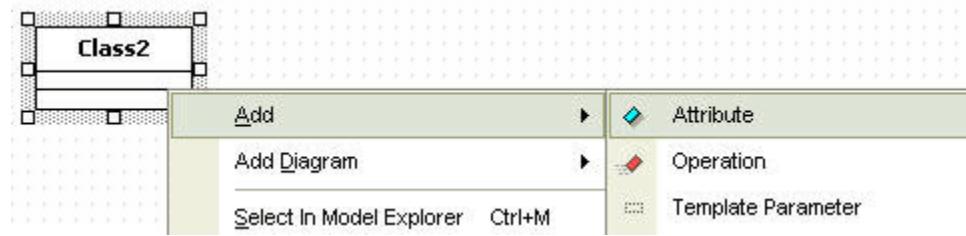
In the case of using quick dialog,

1. Double-click class.
2. Press **[Add Attribute]** button at the quick dialog, and you can add attribute.



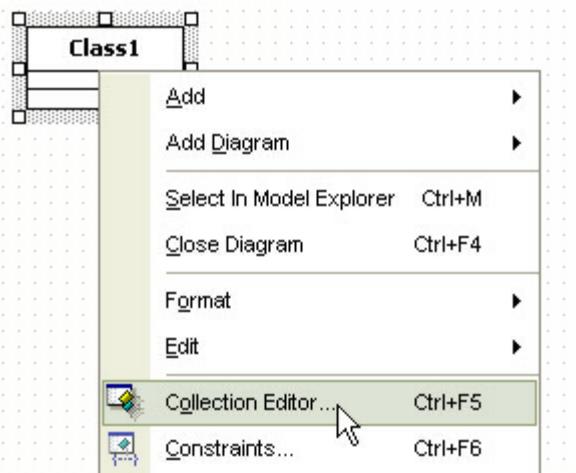
In the case of using model,

1. Select class in the **[main window]** or in the **[model explorer]**.
2. Right-click the selected class, select **[Add] -> [Attribute]** popup menu, and you can do.

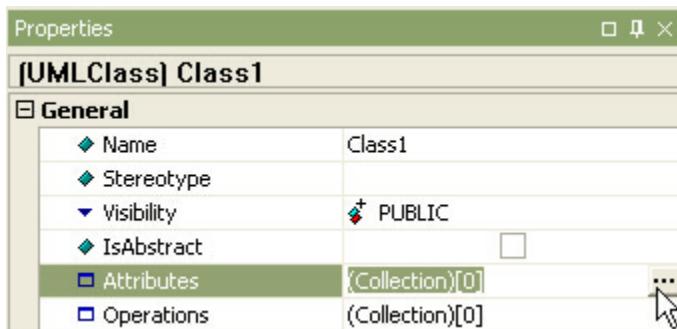


In the last case,

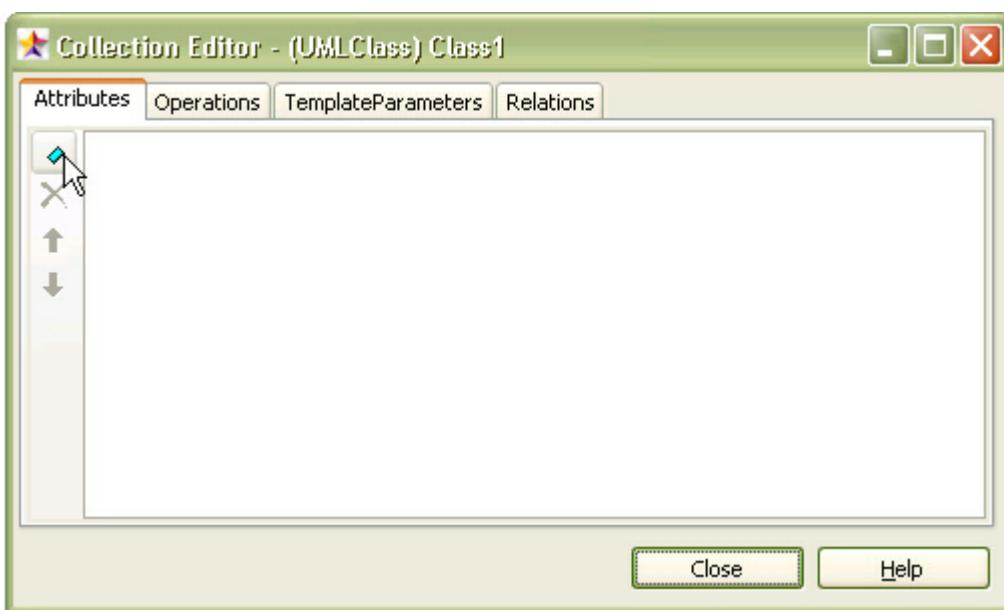
1. Select **[Collection Editor...]** popup menu.



2. Or click button in **[attributes]** property on properties window.



3. At **[attribute]** tab of the **[collection editor]**, you can add attribute by using button.



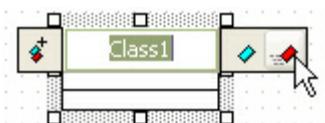
Procedure for adding operation

There are three method to add attribute to class.

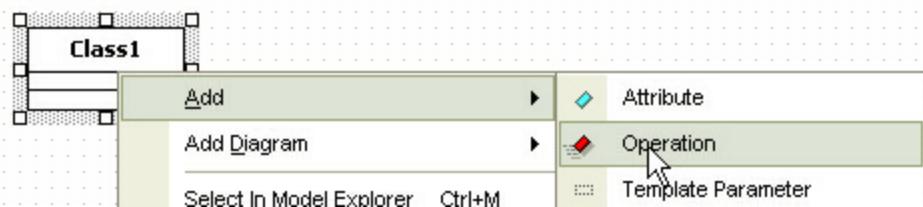
- using quick dialog
- using model in the **[main window]** or the **[model explorer]**
- using **[collection editor]**

In the case of using quick dialog,

1. Double-click class and class quick dialog is shown.
2. Press **[Add Operation]** button at the quick dialog, and you can add operation.

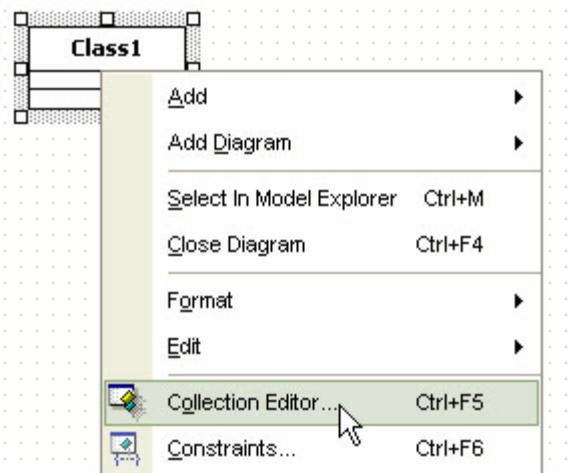


In the case of using model, select class in the **[main window]** or in the **[model explorer]**, right-click the selected class, select **[Add] -> [Operation]** popup menu, and you can do.

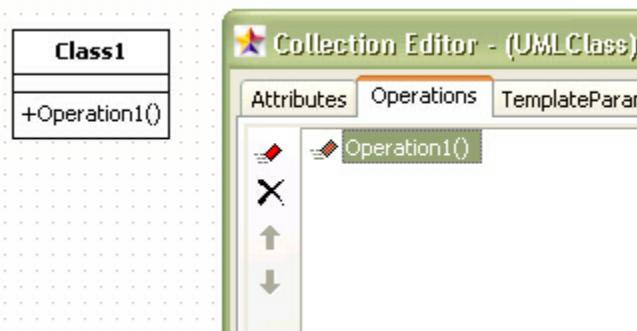


In the last case,

1. Select **[Collection Editor...]** popup menu.



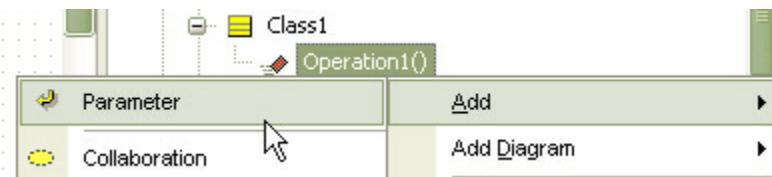
2. At [operations] tab of the [collection editor], you can add operation by using button.



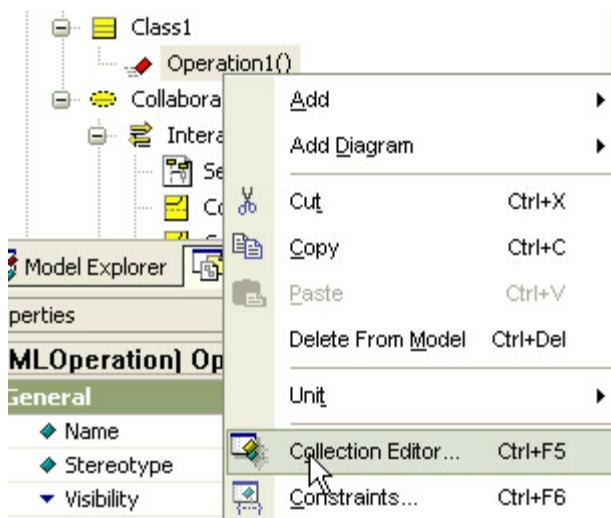
Procedure for adding parameter to operationn

In order to add parameter to operation,

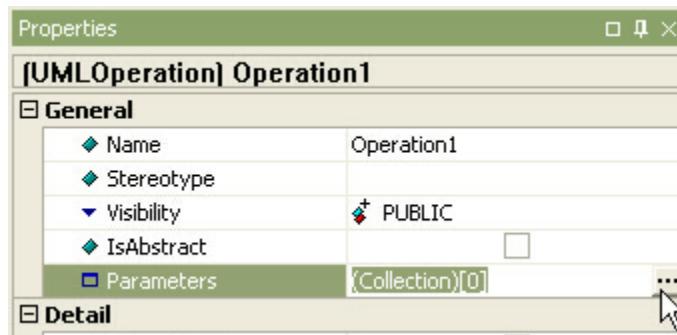
1. Select operation in the [model explorer], select [Add] -> [Parameter] popup menu, and new parameter will be added.



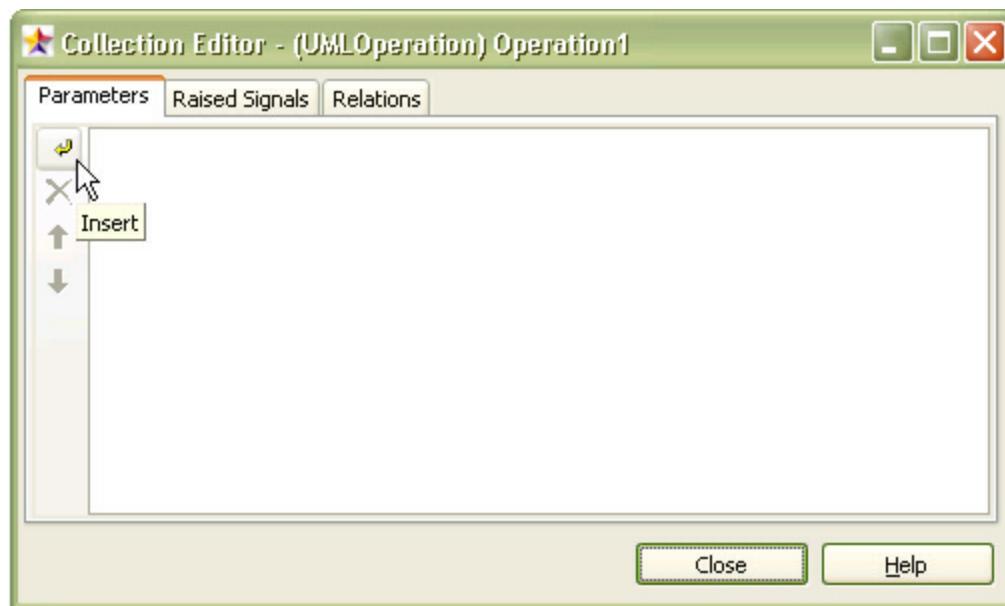
2. Or select operation in the [model explorer], select [Collection Editor...] popup menu.



3.Or click button in **[Parameters]** property on properties window.

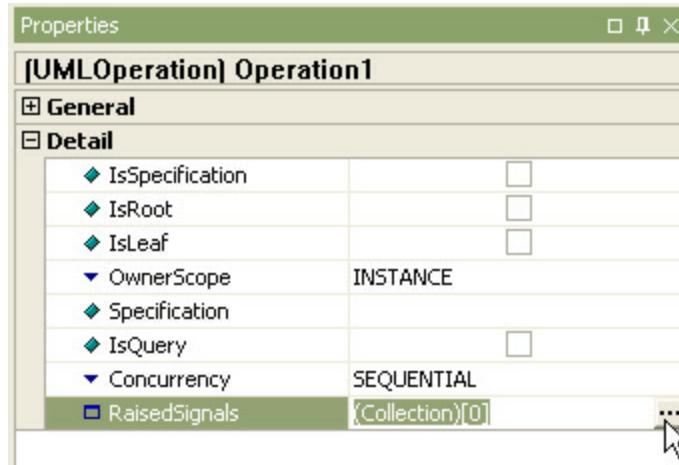


4.At the **[Parameters]** tab of the **[collection editor]**, you can add parameter by using button.

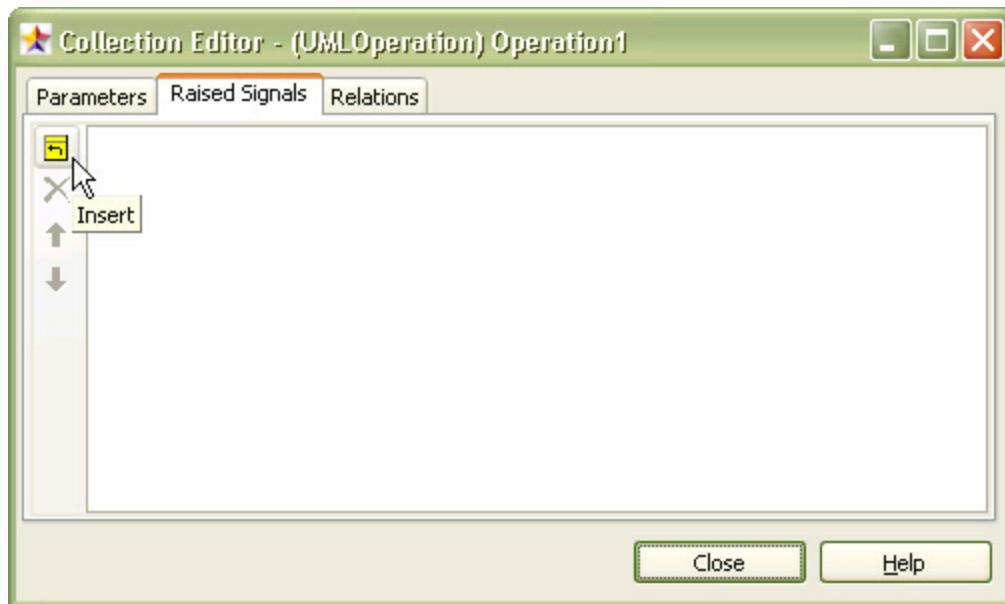
**Procedure for adding exception to operation:**

Before this procedure, there must exist a exception or more. To do this, see "**Procedure for creating signal**" or "**Procedure for creating exception**".

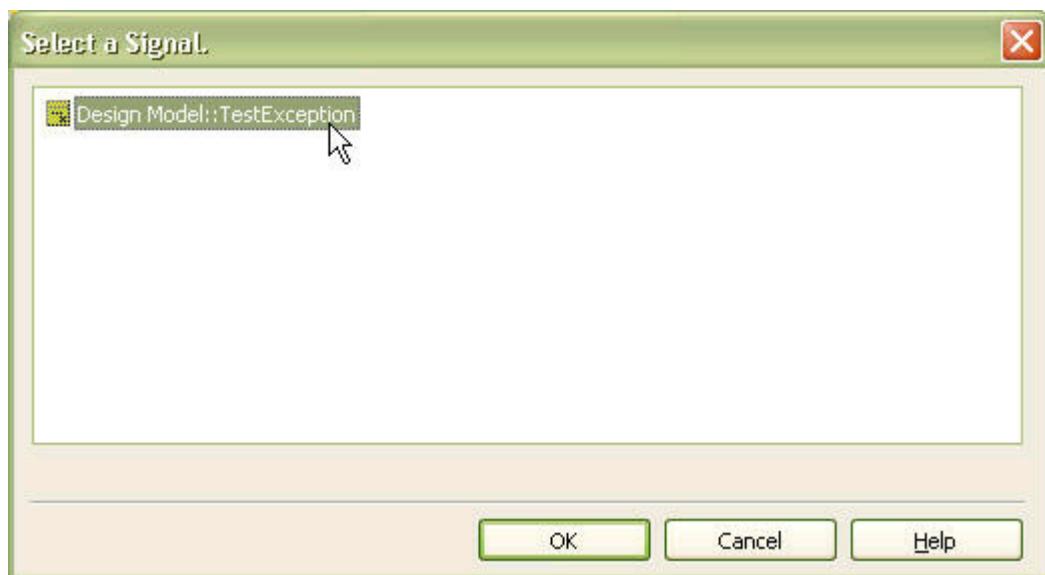
1. Click button in [**RaisedSignals**] property on properties window.



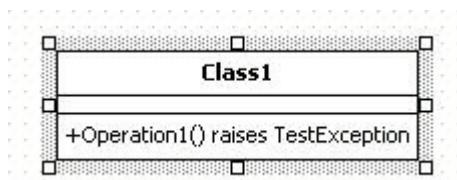
2. At [**Raised Signals**] tab of the [**collection editor**], you can add exception to the operation by using button.



3. At **[Select a Signal]** dialog, select signal or exception raised by operation and click **[OK]** button.



4. The result is as follows.



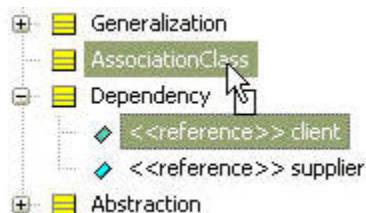
Procedure for moving attribute/operation into other classss

In order to move attribute or operation into the other class,

1. Click a attribute(or operation).



2. Drag it.



3. Drop it into another class.

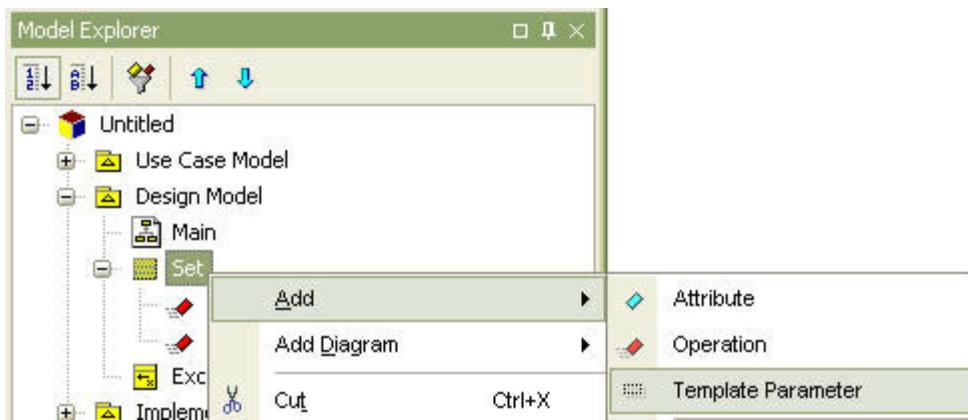


Procedure for adding template parameter to classss

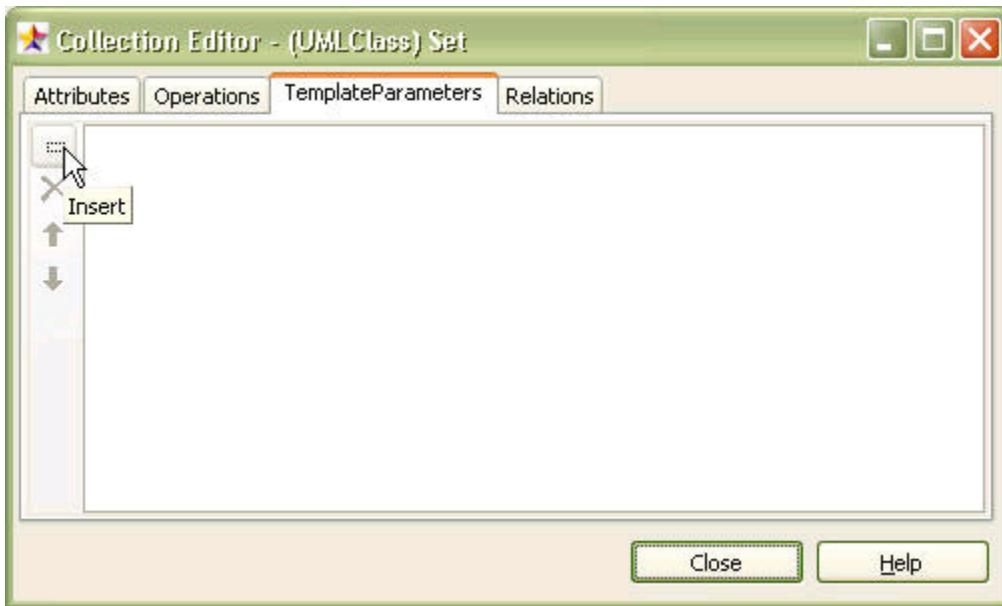
There are two way to add template parameter to class

- using class model in the **[main window]** or the **[model explorer]**
- using **[collection editor]**

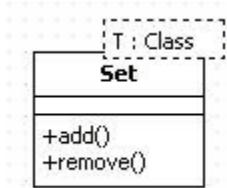
Select class in the **[main window]** or the **[model explorer]**, right-click, and select **[Add] -> [TemplateParameter]** popup menu. Then you can add template to class.



Select **[Collection Editor...]** popup menu or click button in **[TemplateParameter]** property on properties window. At the **[TemplateParameters]** tab of the **[collection editor]**, you can add template parameter to class by using button.



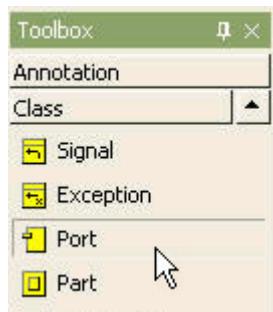
A new template parameter is added to class. The result is as follows.



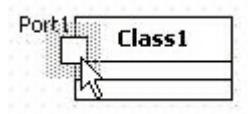
Procedure for creating port

In order to create port,

1. Click **[Toolbox] -> [Class] -> [Port]** button.



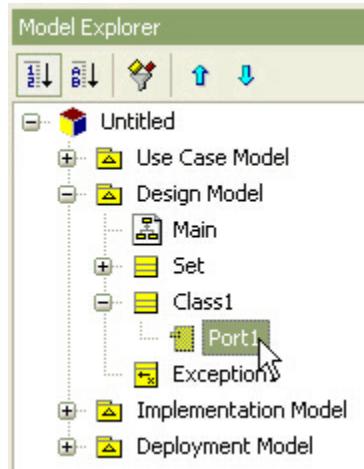
2. And click the class where the port will be contained in the **[main window]**.



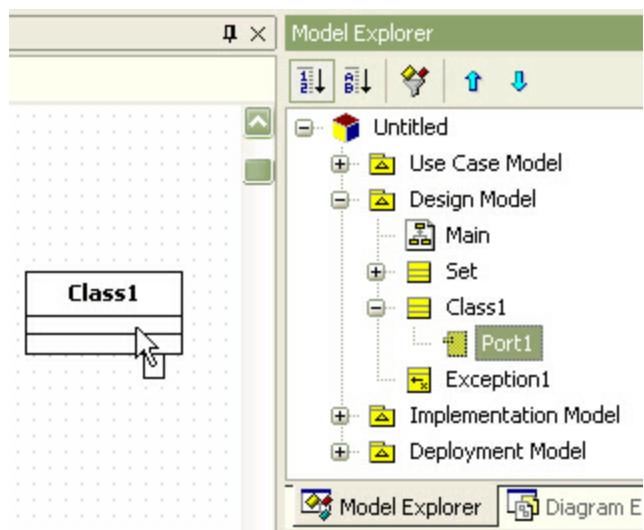
Procedure for creating view by draging port

You can create port by draging port from **[model explorer]** to main diagram.

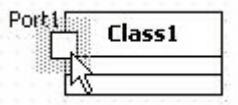
1. Drag port in the **[model explorer]**.



2. Drop on the class in the main diagram. If it is not dropped on the class but on the other area of the diagram, Class with port will be created.



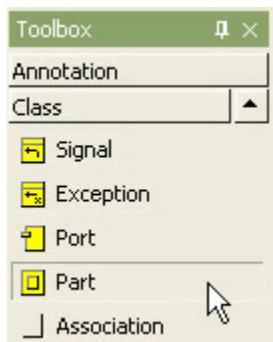
3. The class has a port as follows.



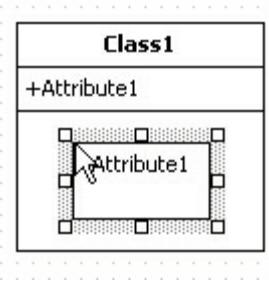
Procedure for creating part

In order to create part,

1. Click [Toolbox] -> [Class] -> [Part] button.



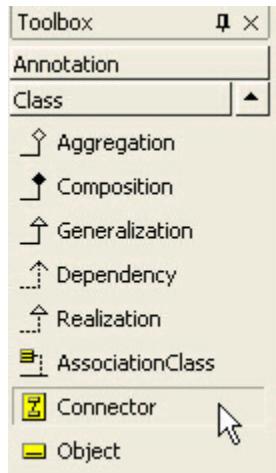
2. And click the class where the part will be contained in the **[main window]**.



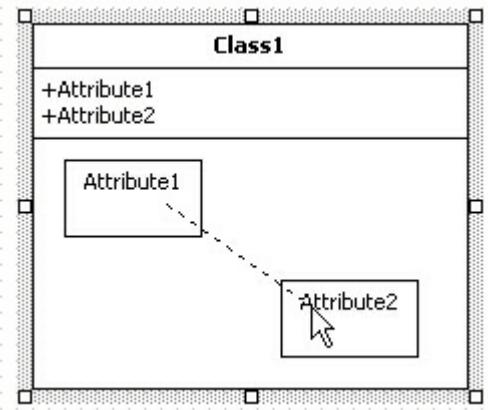
Procedure for creating connector

In order to create connector,

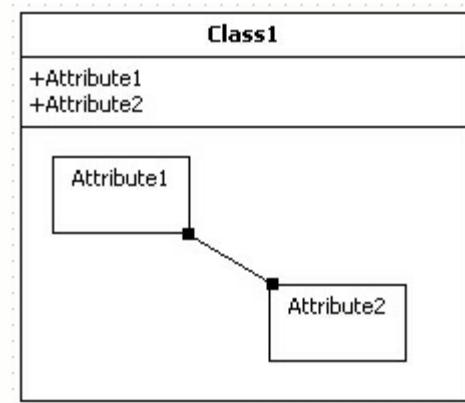
1. Click [Toolbox] -> [Class] -> [Connector] button.



2. Drag from one part and drop to the other part in the [main window].



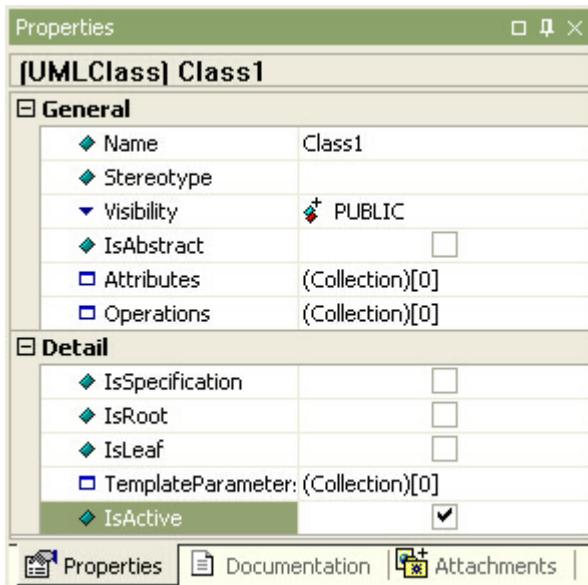
3. Between two parts, new connector is created finally.



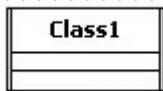
Procedure for setting active class

In order to set class to active class,

1. Set class's [**IsActive**] property to true.



2. The result class is shown as follows.



Interface

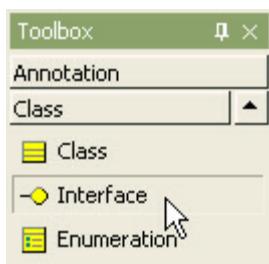
Semantics

An interface is a specifier for the externally-visible operations of a class, component, or other classifier (including subsystems) without specification of internal structure.

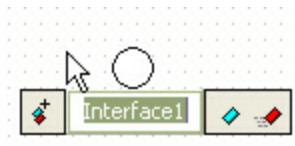
Procedure for creating interface

In order to create class,

1. Click **[Toolbox] -> [Class] -> [Interface]** button.



2. And click at the position where interface will be placed in the **[main window]**. Then interface quick dialog is opened. Enter the interface name at the quick dialog.



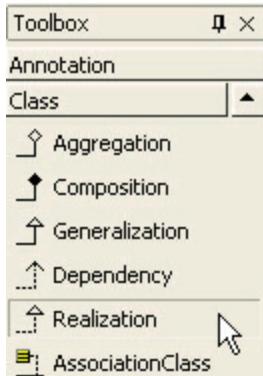
3. Press **[Enter]** key. Then the result is as follows.



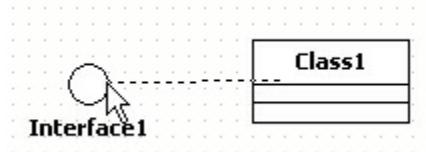
Procedure for creating providing relationship

In order to create providing relationship,

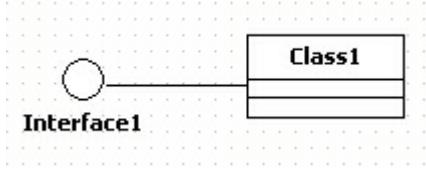
1. Click **[Toolbox] -> [Class] -> [Realization]** button.



2. Drag from one(Class, Port, Part, Package, Subsystem) and drop to interface in the [main window].



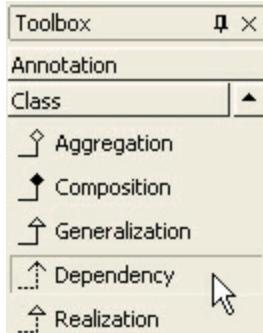
3. Then providing interface relationship is created as follows.



Procedure for creating requiring relationship

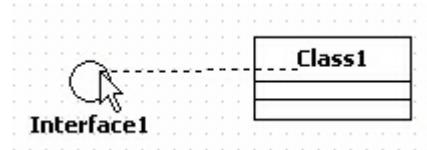
In order to create requiring relationship,

1. Click **[Toolbox] -> [Class] -> [Dependency]** button.

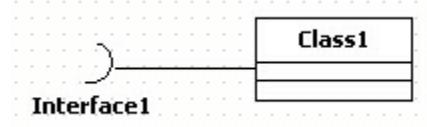


2. Drag from one(Class, Port, Part, Package, Subsystem) and drop to interface in the [main window].

window].



3.Then requiring interface relationship is created as follows.



Enumeration

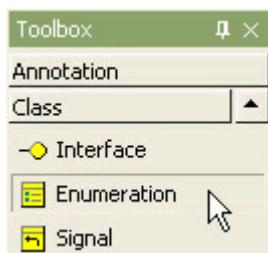
Semantics

An Enumeration is a user-defined data type whose instances are a set of user-specified named enumeration literals. The literals have a relative order but no algebra is defined on them.

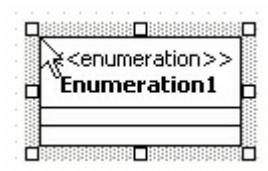
Procedure for creating enumeration

In order to create enumeration,

- 1.Click **[Toolbox] -> [Class] -> [Enumeration]** button.



- 2.And click at the position where enumeration will be placed in the **[main window]**.



Signal

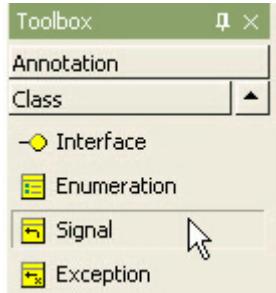
Semantics

A signal is a specification of an asynchronous stimulus communicated between instances. The signal is a child to Classifier, with the parameters expressed as Attributes. A Signal is always asynchronous. A Signal is associated with the BehavioralFeatures that raise it.

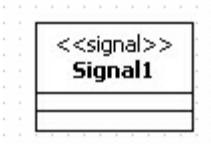
Procedure for creating signal

In order to create signal,

1. Click **[Toolbox] -> [Class] -> [Signal]** button.



2. And click at the position where signal will be placed in the **[main window]**.



Exception

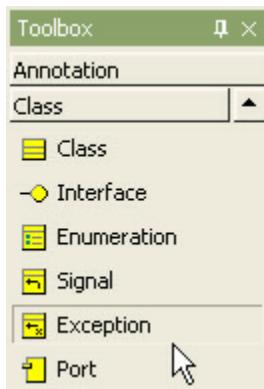
Semantics

An exception is a signal raised by behavioral features typically in case of execution faults. An Exception is associated with the BehavioralFeatures that raise it.

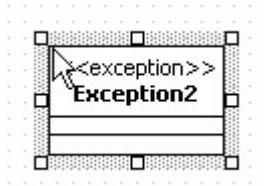
Procedure for creating exception

In order to create exception,

1. Click [Toolbox] -> [Class] -> [Exception] button.



2. And click at the position where exception will be placed in the [main window].



Association

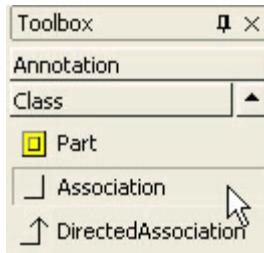
Semantics

An association is an association among exactly two classifiers (including the possibility of an association from a classifier to itself).

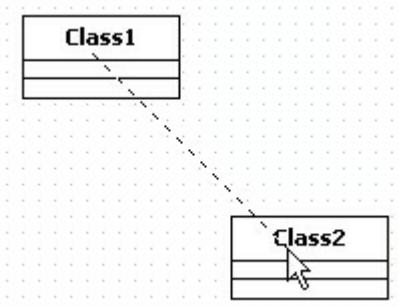
Procedure for creating association

In order to create association,

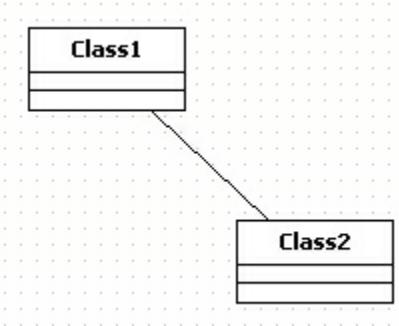
1. Click [Toolbox] -> [Class] -> [Association] button.



2.Drag from one associated and drop to another in the [**main window**].



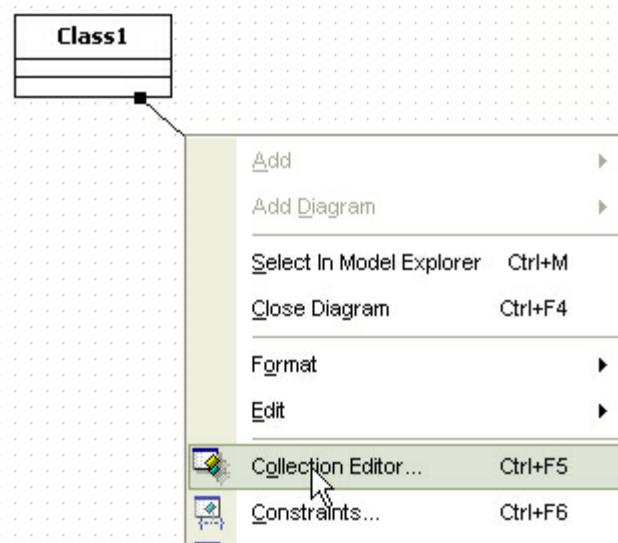
3.Between two classes, a new association is created as follows.



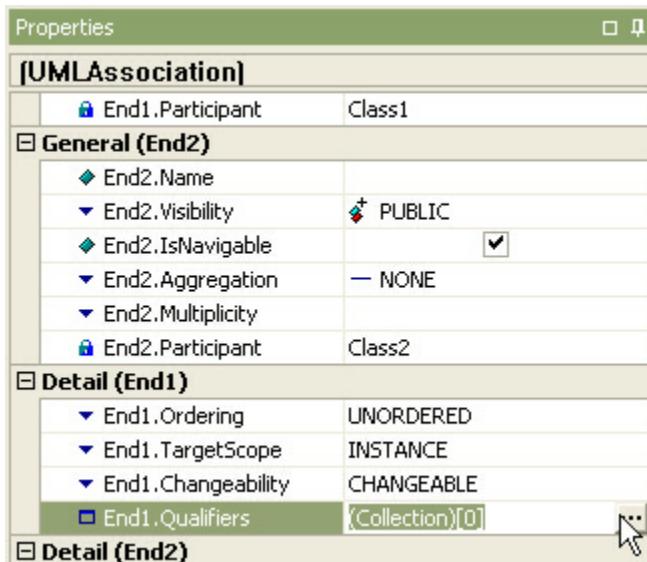
Procedure for adding qualifier to association

In order to add qualifier to association,

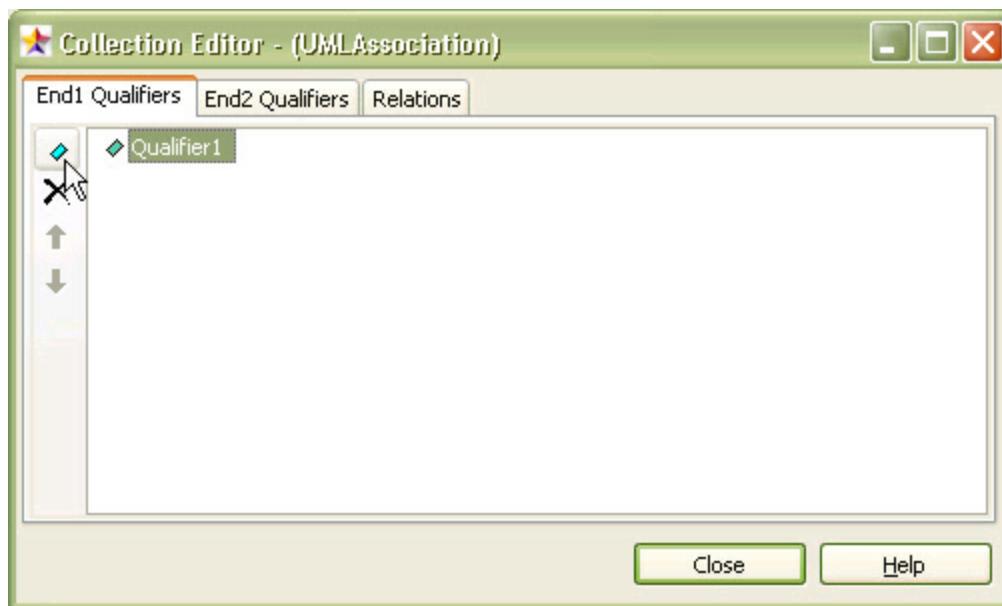
- 1.Select association's [**Collection Editor...**] popup menu.



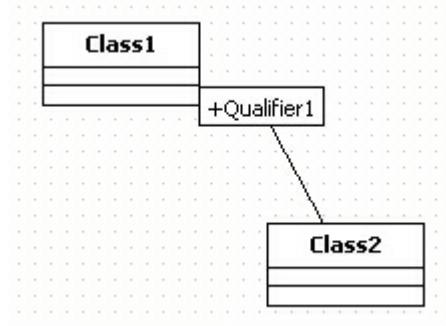
2.Or click button in **[End.Qualifiers]** property on properties window.



3.At **[Qualifiers]** tab of the **[collection editor]**, you can add qualifier to the association by using button.



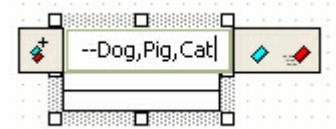
4. The result is as follows.



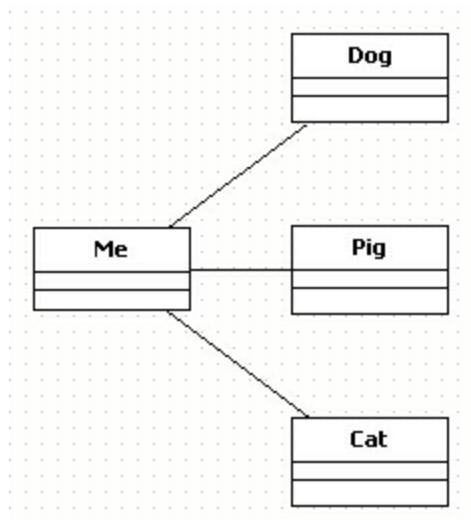
Procedure for creating multiple classes related to current class at once

If you want to create Dog, Pig, Cat classes related to Me class

1. Double-click Me class or press **[Enter]** key. At quick dialog, enter as following.



2. Then three classes with association are created as following.

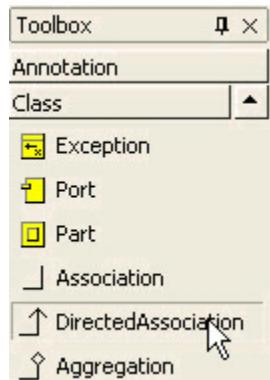


Directed Association

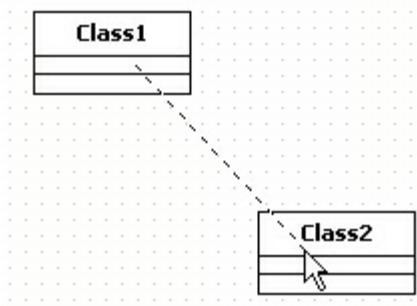
Procedure for creating directed association

Procedure for creating directed association is equal to association's.

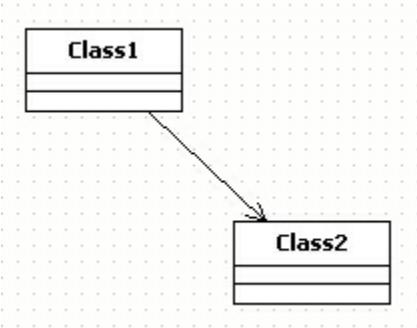
1. Click **[Toolbox] -> [Class] -> [DirectedAssociation]**.



2. Drag and drop between two elements in arrow direction.

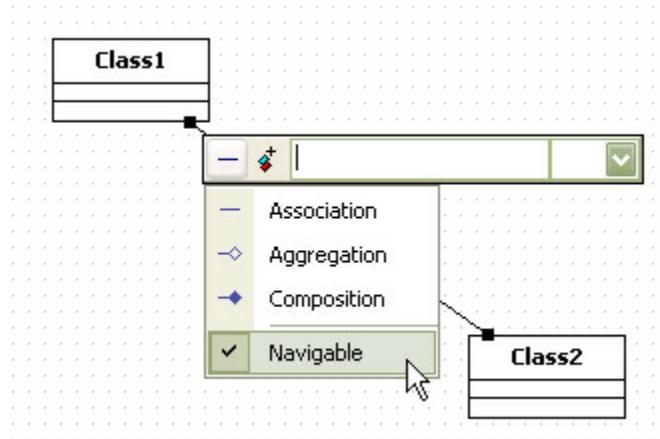


3. The result is as follows.



Procedure for changing association to directed association

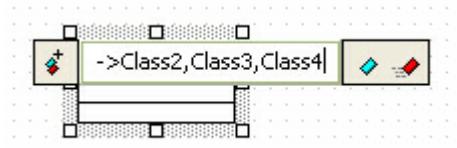
To change association to directed association, click the arrow-opposite-side association end. At the quick dialog, uncheck navigable and association becomes directed.



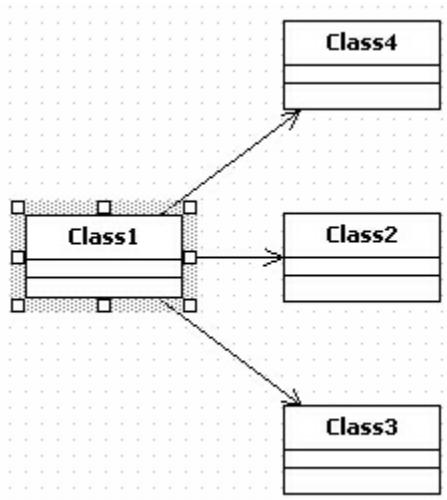
Procedure for creating element having directed association by shortcut creation syntax

In order to create element having directed association, use shortcut creation syntax,

1. Double-click element. At the quick dialog, enter name of elements that have directed association after "->" string and separate names with ",".



2. Press **[Enter]** key and multiple elements associated with selected element are created and arranged automatically.



Aggregate

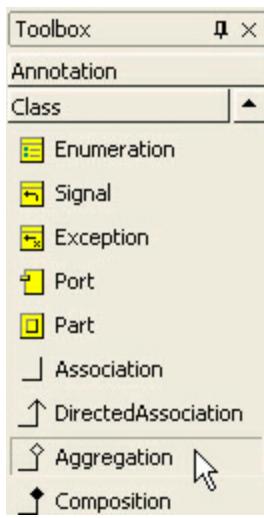
Semantics

An aggregate is a more specific type of association. The aggregate is signified by a hollow diamond on the point where the association connects with the classifier (association end). Aggregate adds the concept of whole and part to the 'vanilla' association. The classifier at the hollow diamond end is the whole.

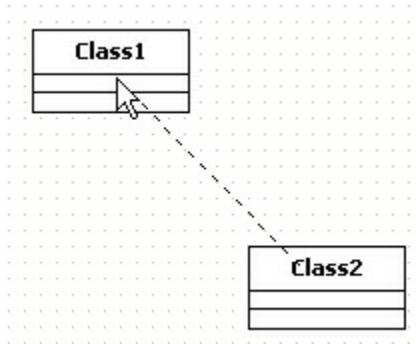
Procedure for creating aggregate

In order to create aggregation,

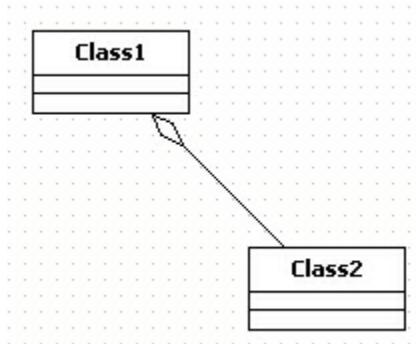
1. Click **[Toolbox] -> [Class] -> [Aggregation]** button.



2. Drag from one associated and drop to another in the [main window].



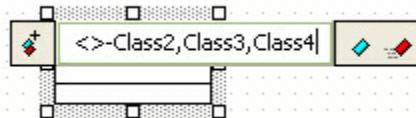
3. The result is as follows.



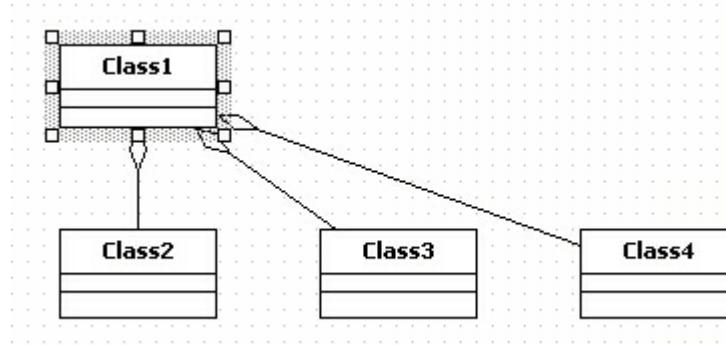
Procedure for creating aggregated class by shortcut creation syntax

In order to create class aggregated to selected class, use shortcut creation syntax.

1. Double-click to popup quick dialog. At the quick dialog, enter name of class aggregated to current class after "<>->" string and separate names with ",".



2. Press [Enter] key and classes aggregated to selected class are created and arranged automatically.



Composite

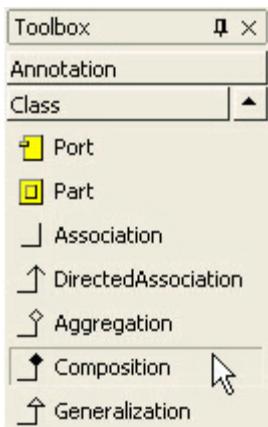
Semantics

A composite is a more specific type of association. The composite is signified by a filled diamond on the point where the association connects with the classifier (association end). Composite adds the concept of whole and part to the "vanilla" association and responsibility for the lifetime of the parts. The classifier at the filled diamond end is the whole.

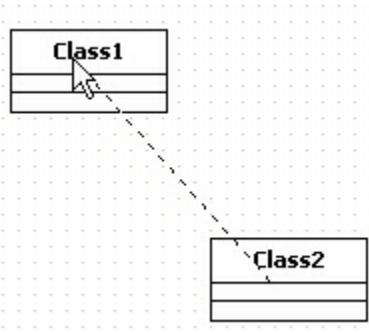
Procedure for creating composition

In order to create composition,

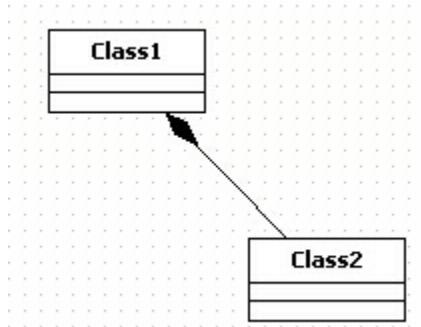
1. Click [Toolbox] -> [Class] -> [Composition] button.



2. Drag from one class and drop to another class composed in the **[main window]**.



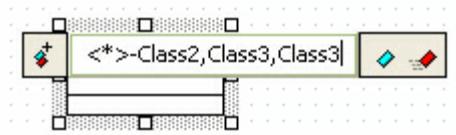
3. Between two classes, a new composition relationship is created as follows.



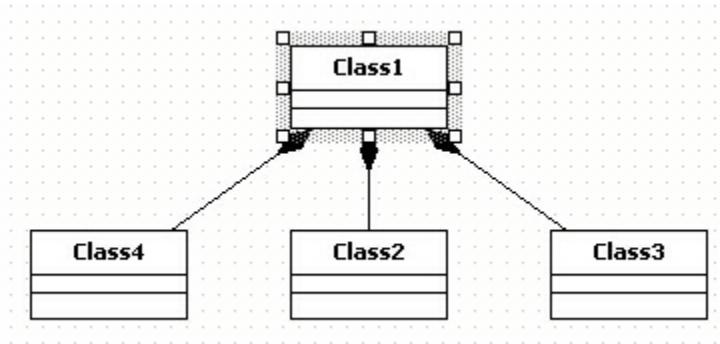
Procedure for creating composing class by shortcut creation syntax

In order to create class composing selected class, use shortcut creation syntax.

1. Double-click to popup quick dialog. At the quick dialog, enter name of class composing selected class after "<*>-" string and separate names with ",".



2. Press **[Enter]** key and classes composing selected class are created and arranged automatically.



Generalization

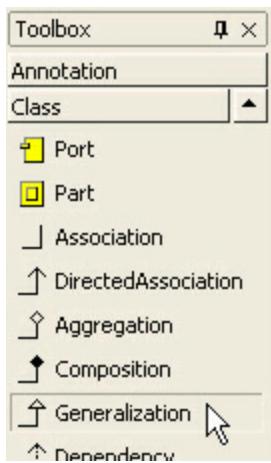
Semantics

Generalization is the taxonomic relationship between a more general element (the parent) and a more specific element (the child) that is fully consistent with the first element and that adds additional information. It is used for classes, packages, usecases, and other elements.

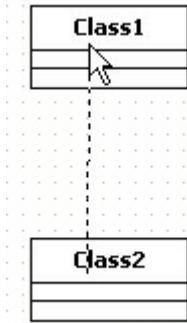
Procedure for creating generalization

In order to create generalization,

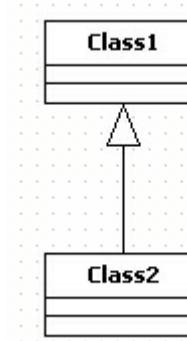
1. Click **[Toolbox] -> [Class] -> [Generalization]** button.



2. Drag from child element and drop to parent element in the [main window].



3. Then a new generalization is created.

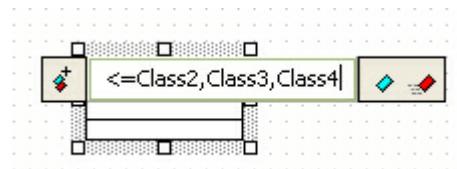


Procedure for creating multiple children classes at once.

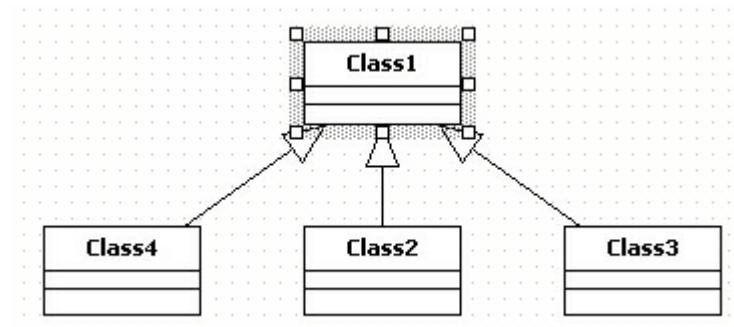
In order to create multiple children classes inheriting selected class at once, use shortcut creation syntax.

1. Double-click to popup quick dialog. At the quick dialog, enter name of class inheriting

selected class after "<=" string and separate names with ",".



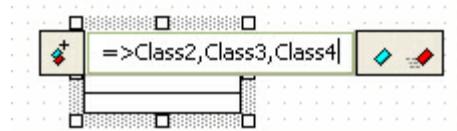
2. The children classes are created below selected class and arranged automatically.



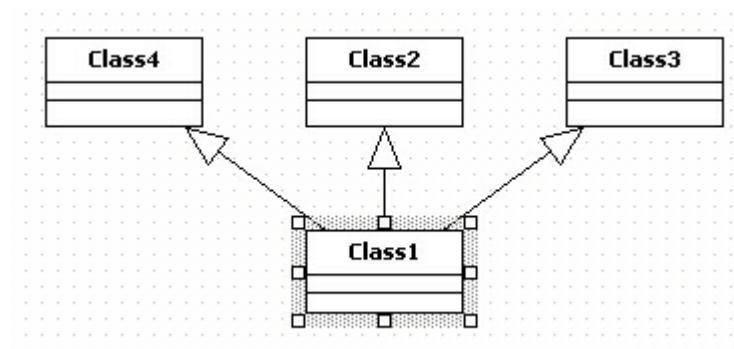
Procedure for creating multiple parent classes at once

In order to create multiple parent classes of selected class at once, use shortcut creation syntax.

1. Double-click to popup quick dialog. At the quick dialog, enter name of parent classes of selected class after ">=" string and separate names with ",".



2. The parent classes are created above selected class and arranged automatically.



Dependency

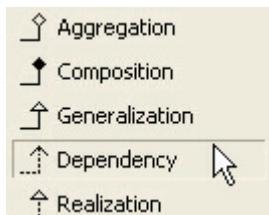
Semantics

A dependency indicates a semantic relationship between two model elements (or two sets of model elements). It relates the model elements themselves and does not require a set of instances for its meaning. It indicates a situation in which a change to the target element may require a change to the source element in the dependency.

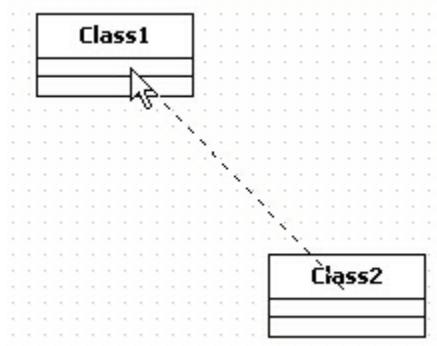
Procedure for creating dependency

In order to create dependency,

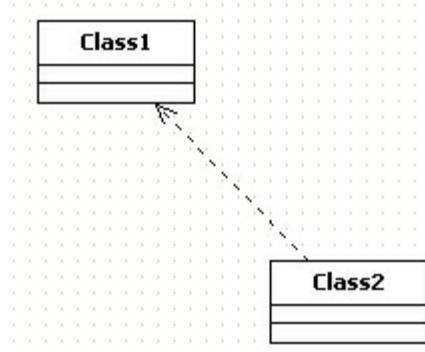
1. Click **[Toolbox] -> [Class] -> [Dependency]** button.



2. Drag and drop between elements in the **[main window]** in depending direction.



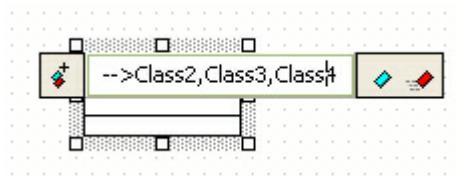
3. A new dependency between two classes is created.



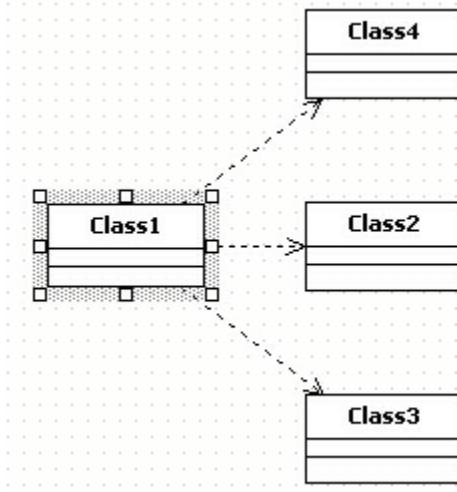
Procedure for dependent element by shortcut creation syntax

In order to create element depending by selected element, use shortcut creation syntax.

1. Double-click to popup quick dialog. At the quick dialog, enter name of dependent elements by selected element after "-->" string and separate names with ",".



2. Press **[Enter]** key and dependent elements by selected class are created and arranged automatically.



Realization

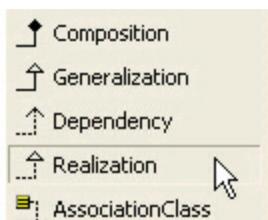
Semantics

A realization signifies that a relationship exists between a set of elements that form a specification (the client) and another set of elements that form the implementation (the supplier).

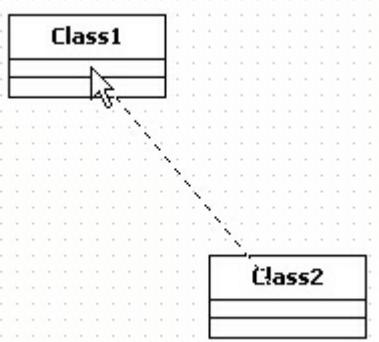
Procedure for creating realization

In order to create realization,

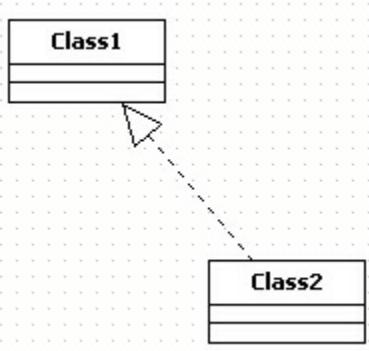
1. Click **[Toolbox] -> [Class] -> [Realization]** button.



2. Drag and drop between elements in the **[main window]** in realization direction.



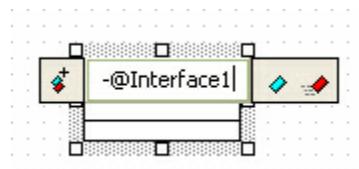
3. The result is as follows.



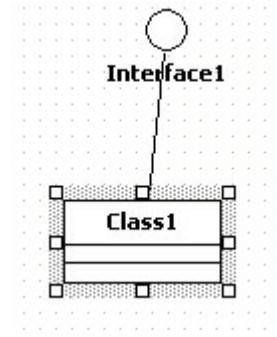
Procedure for creating realization target element of selected element

In order to create target interface element of selected element, use shortcut creation syntax.

1. Double-click to popup quick dialog. At the quick dialog, enter name of interface elements of selected element after "-@" string and separate names with ",".



2. Press **[Enter]** key and interface elements of selected element are created and arranged automatically.



Association Class

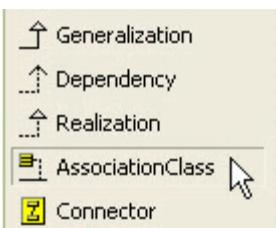
Semantics

An association class is an association that is also a class. It not only connects a set of classifiers but also defines a set of features that belong to the relationship itself and not any of the classifiers.

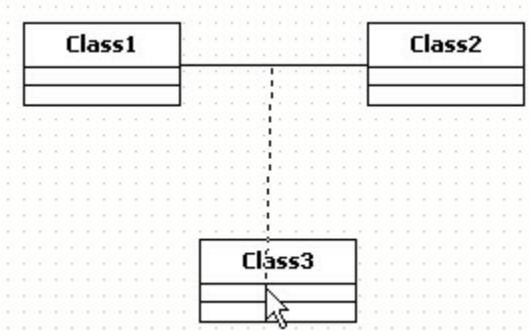
Procedure for creating association class

In order to create association class,

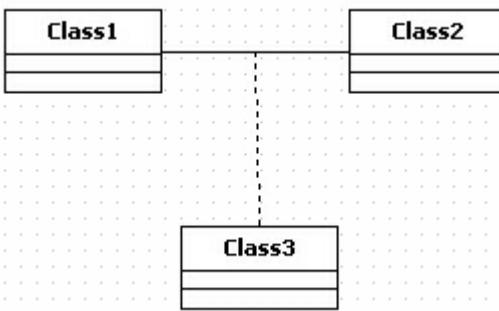
1. Click **[Toolbox] -> [Class] -> [AssociationClass]** button.



2. Drag from association and drop to the class as association class in the [main window].



3. The result is as follows.



Object

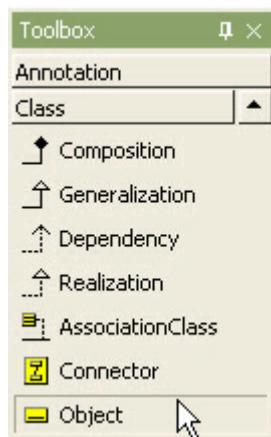
Semantics

An object represents a particular instance of a class. It has identity and attribute values. A similar notation also represents a role within a collaboration because roles have instance-like characteristics.

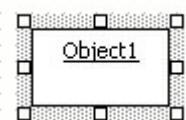
Procedure for creating object

In order to create object,

1. Click [Toolbox] -> [Class] -> [Object] button.



2. And click at the position where object will be placed in the [main window].

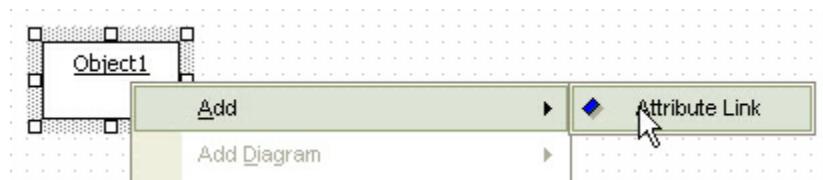


Procedure for adding AttributeLink to object

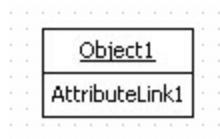
There are two way to add AttributeLink to Object.

- using object model in the [main window] or the [model explorer]
- using [collection editor]

In the case of using object model, select object in the [main window] or in the [model explorer], right-click the selected object, select [Add] -> [Attribute Link] popup menu, and you can add Attribute Link.



In the other case, select [Collection Editor...] popup menu of object or click button in slots property on properties window. At [Slots] tab of the [collection editor], you can add attribute link by using button.



Link

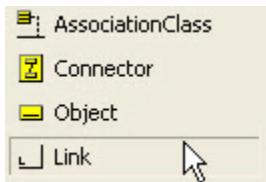
Semantics

A link is a tuple (list) of object references. Most commonly, it is a pair of object references. It is an instance of an association.

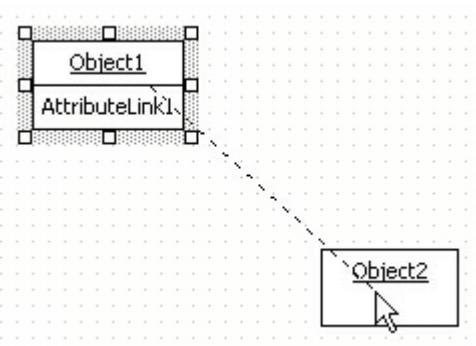
Procedure for creating link

In order to create Link,

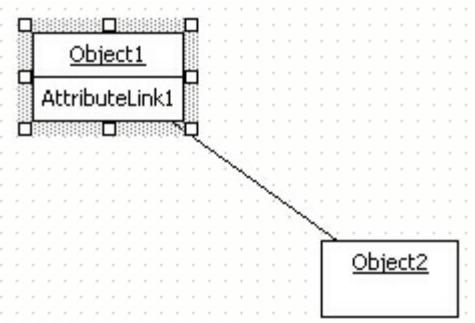
1. Click **[Toolbox] -> [Class] -> [Link]** button.



2. Drag from one Object and drop to the other Object in the **[main window]**.



3. The result is as follows.

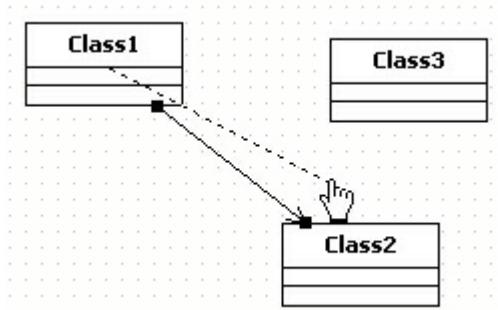


Relationship

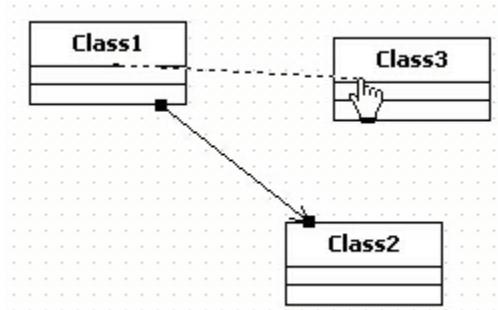
Procedure for reconnecting to another element

In order to reconnect to another element,

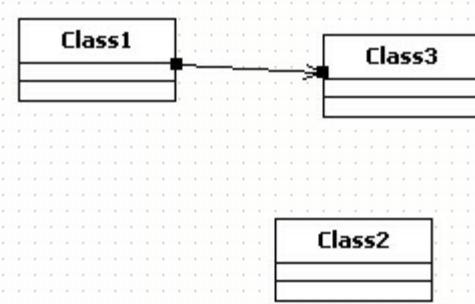
1. Drag the end of relationship.



2. And drop it to another element.



3. Then connection's end will be changed.



6.3 Sequence Diagrams

The following elements are available in a sequence diagram.

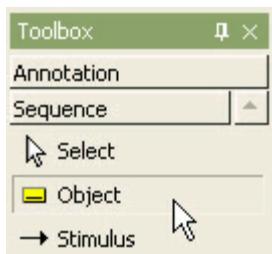
- Object
- Stimulus
- Self Stimulus
- Combined Fragment
- Interaction Operand
- Frame
- Sequence Numbers
- Message signature Style

Object

Procedure for creating object

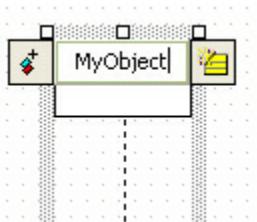
In order to create object,

1. Click **[Toolbox] -> [Sequence] -> [Object]** button.

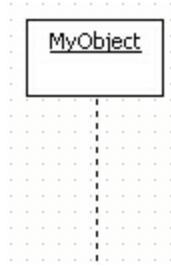


2. And click at the position where object will be placed in the [main window].

3. Object quick dialog is shown. At the quick dialog, enter the object name.



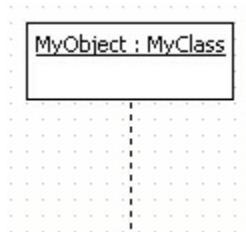
4. Press [**Enter**] key.



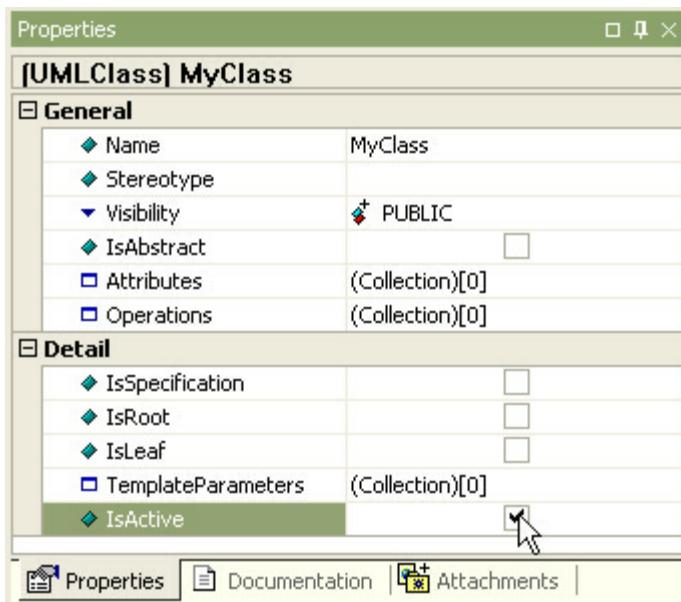
Procedure for setting active object

In order to set class to active object,

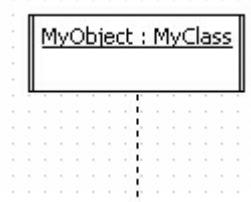
1. Set assigned class's [**IsActive**] property to true.



2. For MyObject, change MyClass's IsActive property.



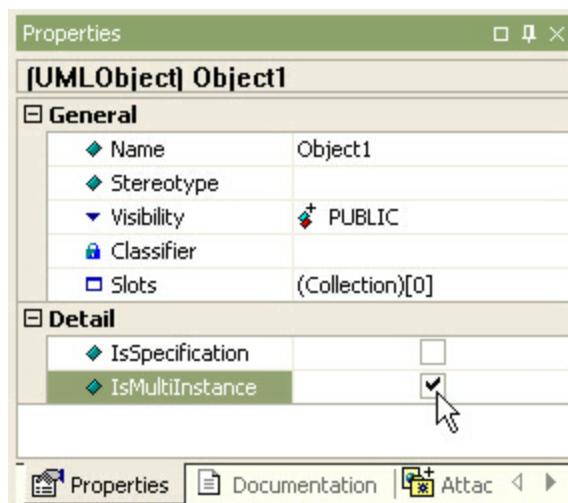
3. If class property is not assigned, you can't change object to active object. The result is as follows.



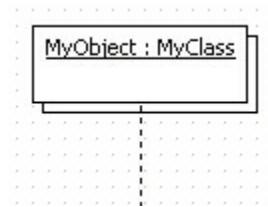
Procedure for setting to multi object

In order to set object to multi object,

1. Set object's **[IsMultiInstance]** property to true.



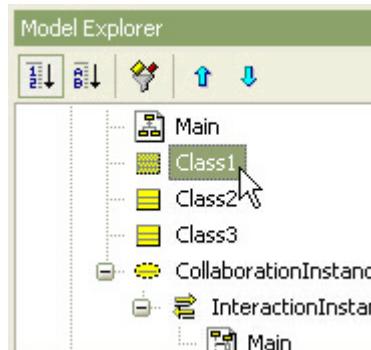
2. Then the object is changed to multi object.



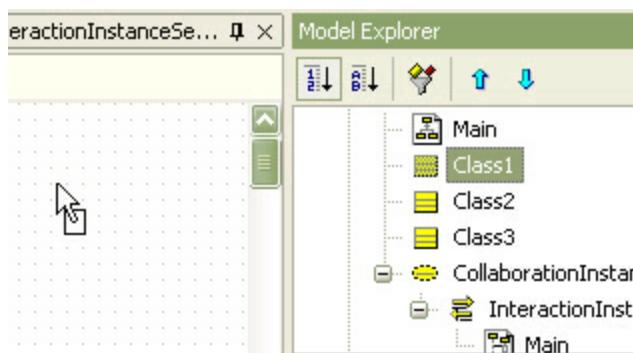
Procedure for creating object from class

In order to create object from class,

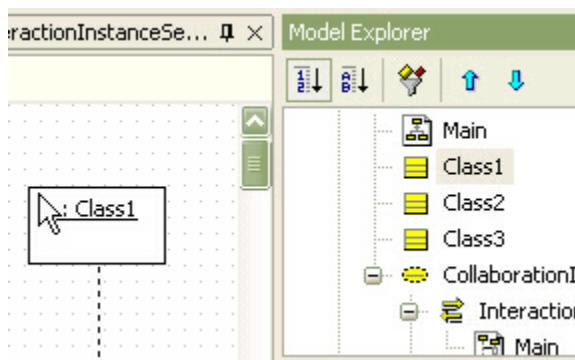
1. Select class in the [model explorer].



2. Drag and drop it into [main window].



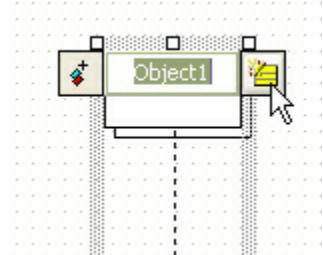
3. Finally, a object is created on the diagram.



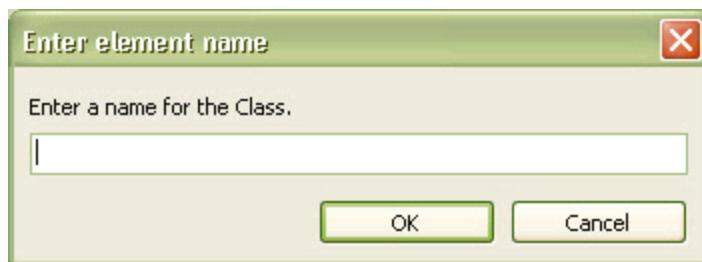
Procedure for creating class from object

If class is not assigned to object,

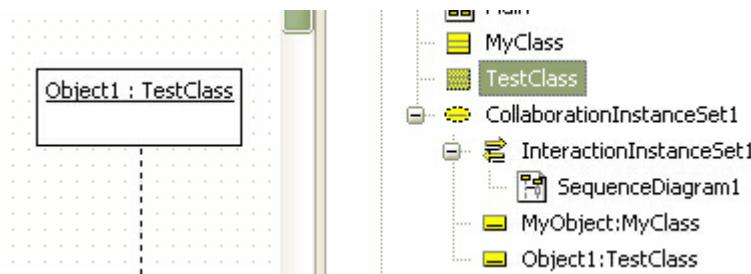
1. Double-click object to pop up quick dialog, click add class button



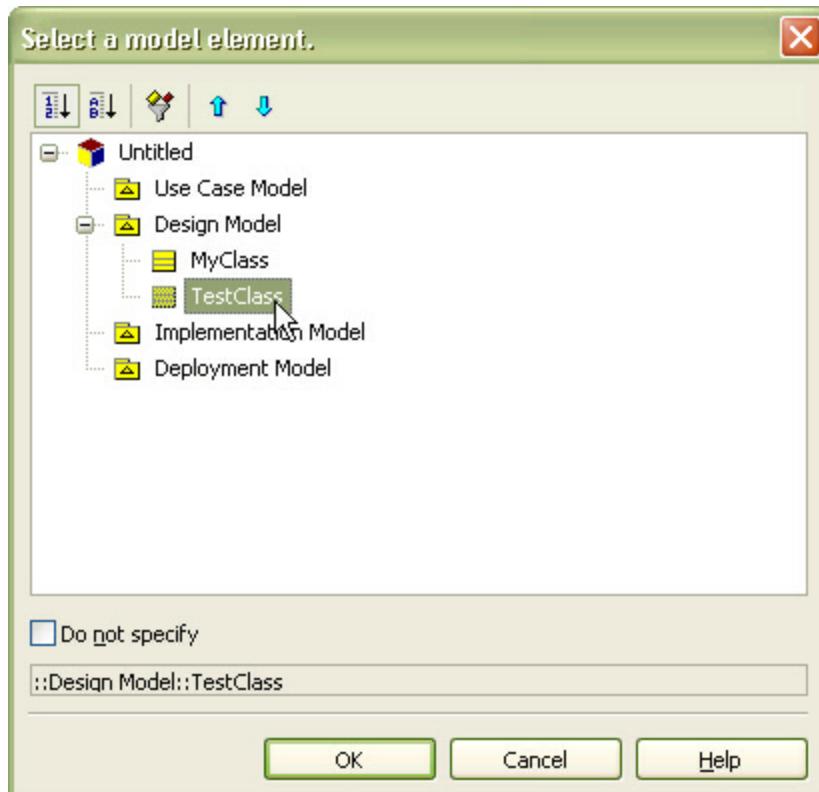
2. At the [Enter element name] dialog, enter the new class name.



3. And new class is created and assigned to object.



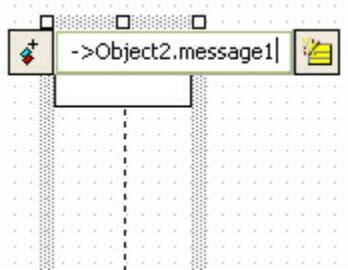
4. If you want existing class to be assigned to object, click button in object's classifier property, and select class to be assigned to object at the **[Select a model element]** dialog.



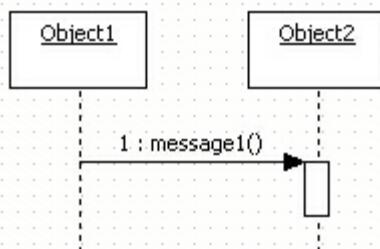
Procedure for creating outgoing from object stimulus by using shortcut creation syntax

In order to create outgoing stimulus from selected object to another object,

1. Double-click from-object, or select from-object and press **[Enter]** key to pop up quick dialog.
2. At the quick dialog, enter stimulus name after ">" string ("<" string for incoming and "<-" for outgoing with return).



3. Press **[Enter]** key and outgoing stimulus from selected object to target object is created and placed at the last order.



Stimulus

Semantics

A Stimulus is a communication between two Instances that conveys information with the expectation that action will ensue. A Stimulus will cause an Operation to be invoked, raise a Signal, or cause an Instance to be created or destroyed.

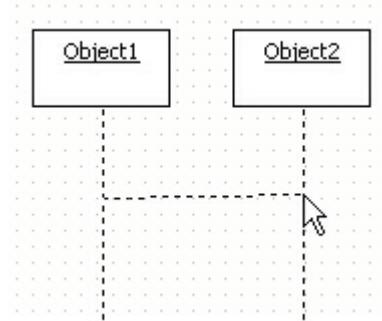
Procedure for creating stimulus

In order to create stimulus,

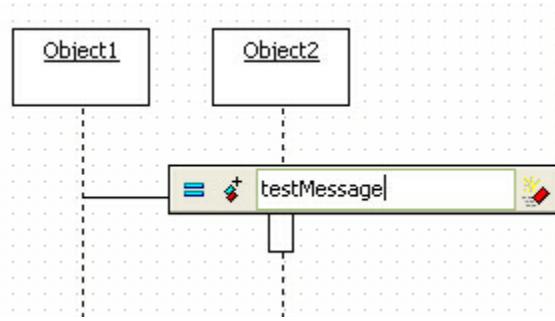
1. Click **[Toolbox] -> [Sequence] -> [Stimulus]** button.



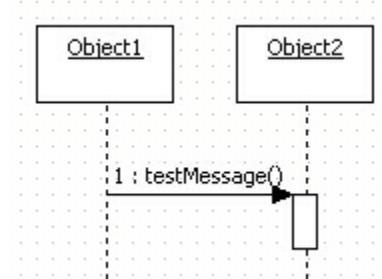
2. Drag from one object, and drop to the other(object or lifeline) in the **[main window]** in outgoing direction.



3. Stimulus quick dialog is opened. Enter the stimulus name at the quick dialog and press **[Enter]** key.



4. Finally, a stimulus is created as follows.

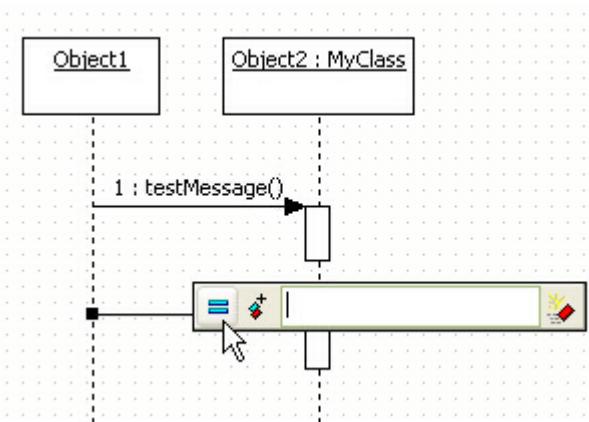


Procedure for using operation in class as stimulus

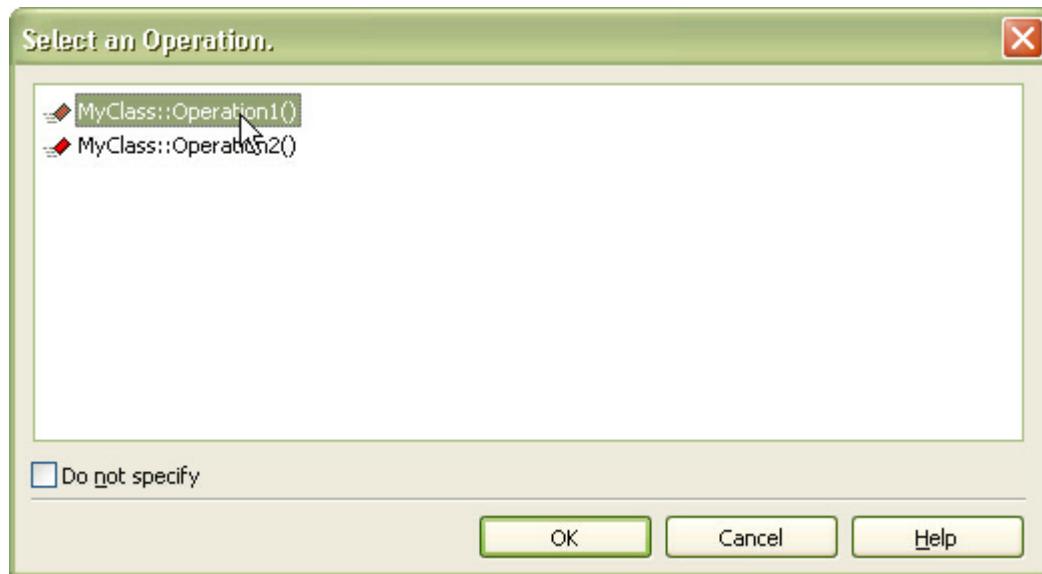
If classifier property of receiver(object) of stimulus is assigned and you want to assign operation to stimulus,

1. Double-click stimulus

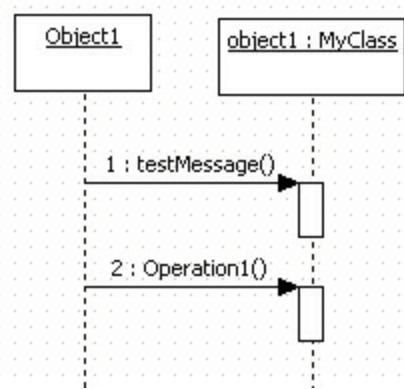
2. Click  button at the quick dialog.



3. Select operation on the **[Select an operation]** dialog, and click **[OK]** button.



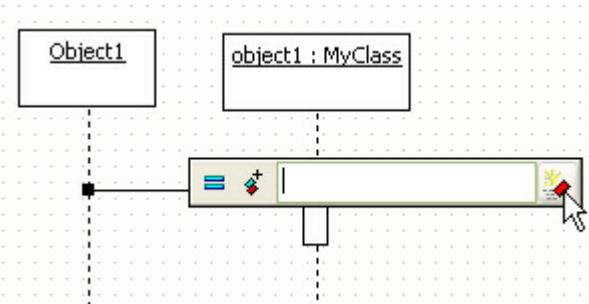
4. New stimulus mapped to class's operation is added as follows.



Procedure for creating operation of class from object

To create operation of class as stimulus's receiver from object and assign it to stimulus,

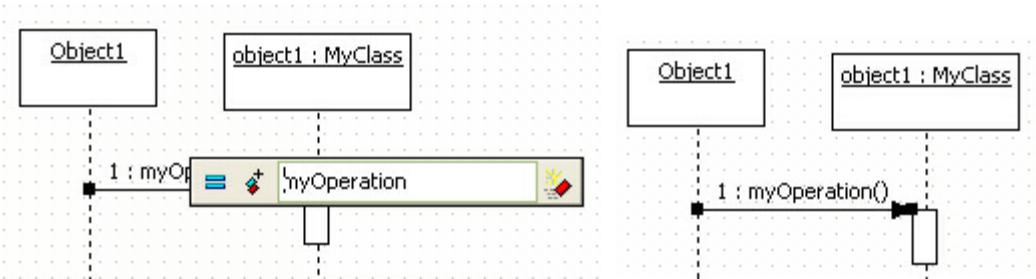
1. Double-click stimulus, click button at the quick dialog.



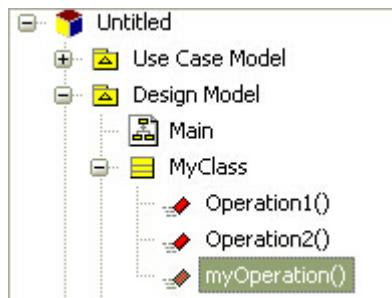
2. Enter new operation name to be created, and click [OK] button.



3. New operation is added to the class and text is filled at the quick dialog (This procedure is valid when there exists assigned class.). Press [Enter] key.



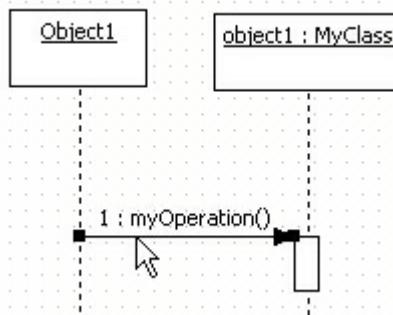
4. See **[model explorer]** to confirm creation of new operation.



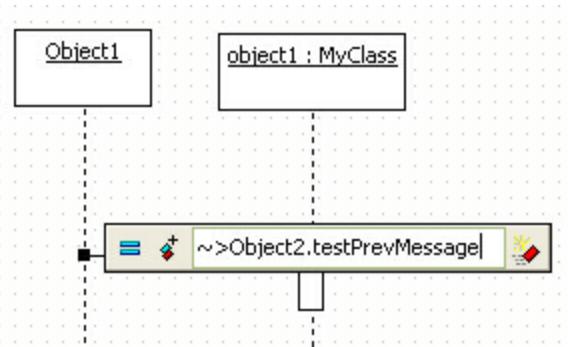
Procedure for creating previous stimulus of current stimulus by using shortcut creation syntax

In order to create previous stimulus to current stimulus,

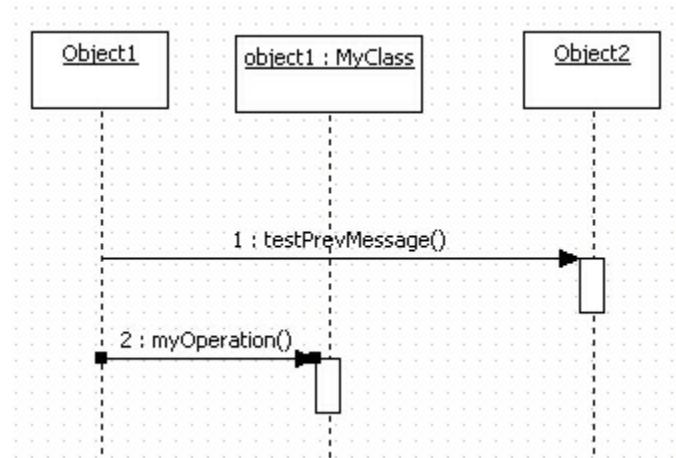
1. Double-click a stimulus, or select a stimulus and press **[Enter]** key.



2. At the quick dialog, After ">>" string("<~" for incoming stimulus), enter target object name and stimulus name.



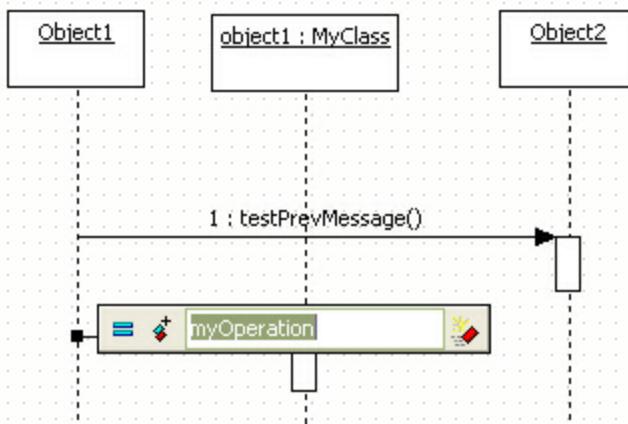
3. Press **[Enter]** key, and then new object and stimulus are created and arranged above selected stimulus.



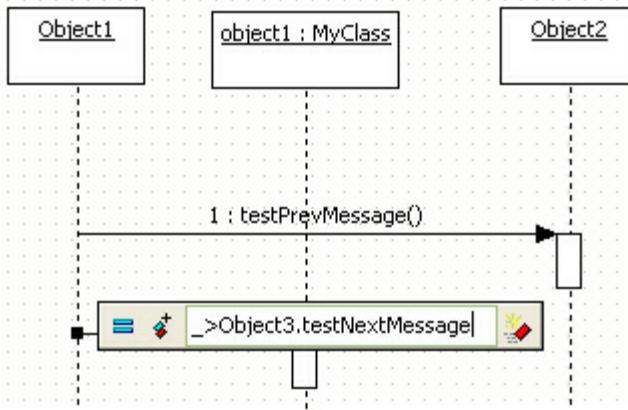
Procedure for creating next stimulus to current stimulus by using shortcut creation syntax

In order to create next stimulus to selected stimulus,

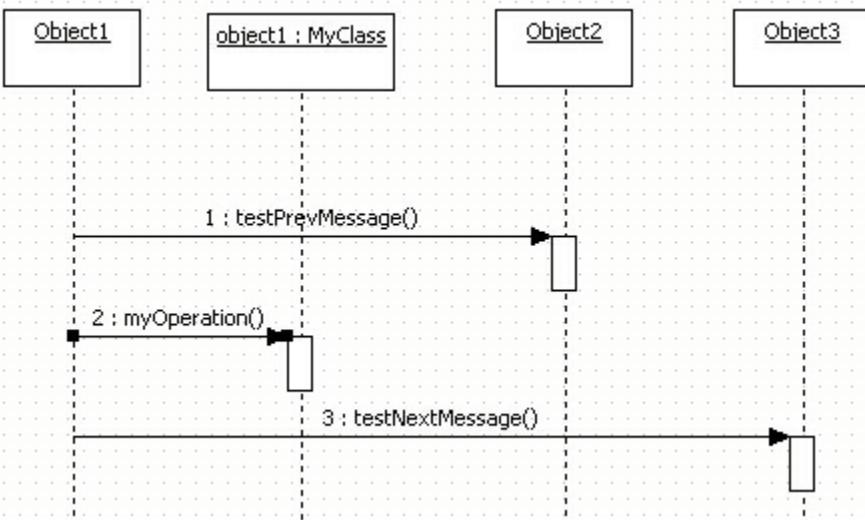
1. Double-click a stimulus, or select a stimulus and press **[Enter]** key.



2. At the quick dialog, After ">" string("<_" for incoming stimulus), enter target object name and stimulus name.



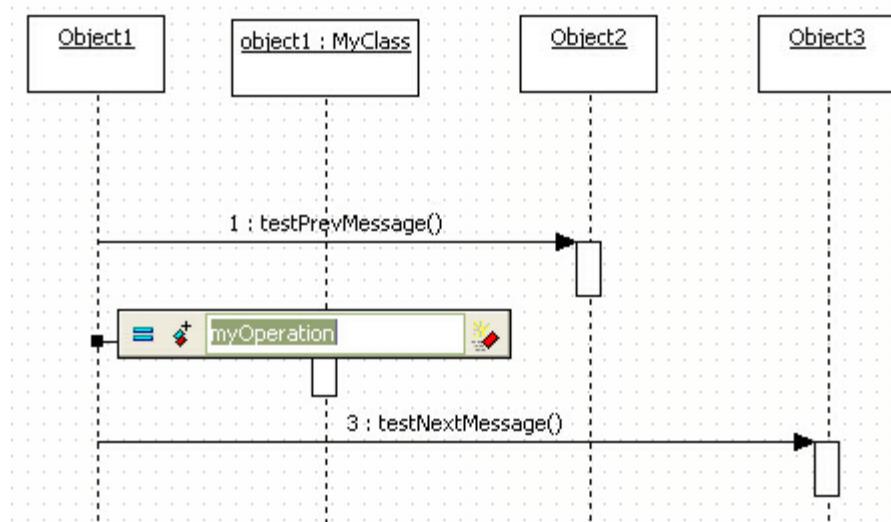
3. Press **[Enter]** key, and then new object and stimulus are created and arranged next to selected stimulus.



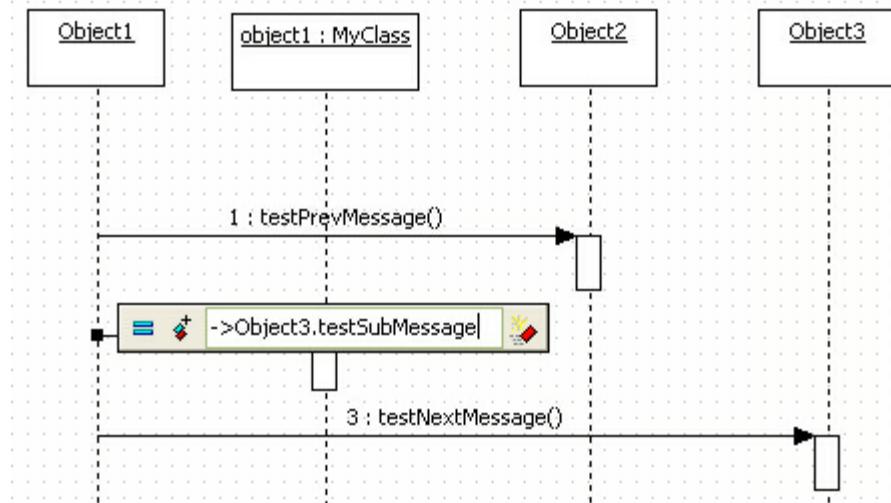
Procedure for creating sub stimulus by using shortcut creation syntax

In order to create a sub stimulus of selected stimulus,

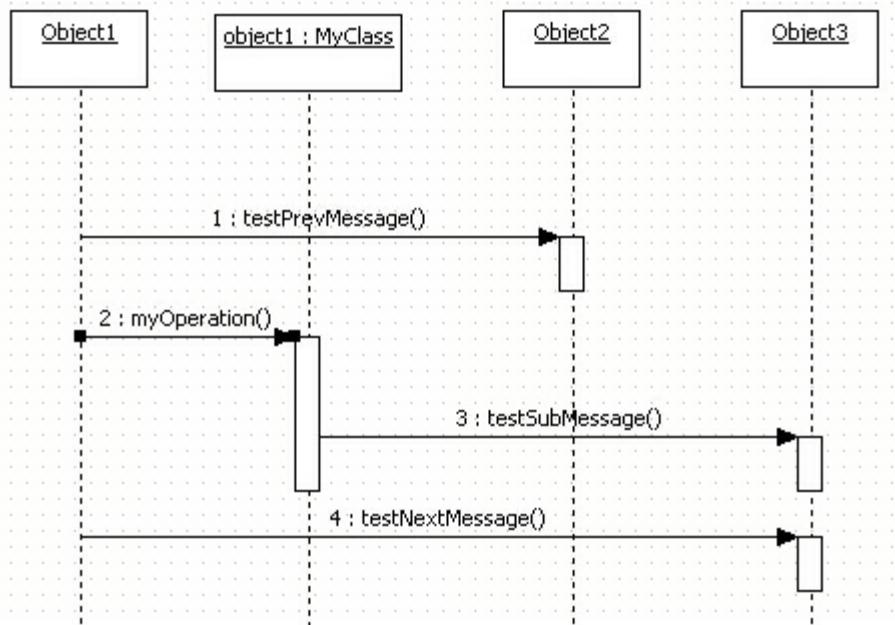
1. Double-click a stimulus, or select a stimulus and press **[Enter]** key.



2. At the quick dialog, After ">->" string("<->" for incoming stimulus), enter target object name and sub stimulus name.



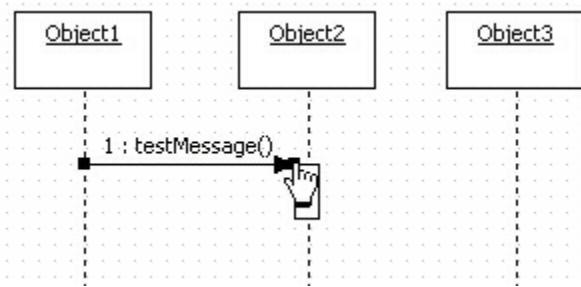
3. Press **[Enter]** key, and then new object and stimulus are created and arranged on the bottom of selected stimulus's activation.



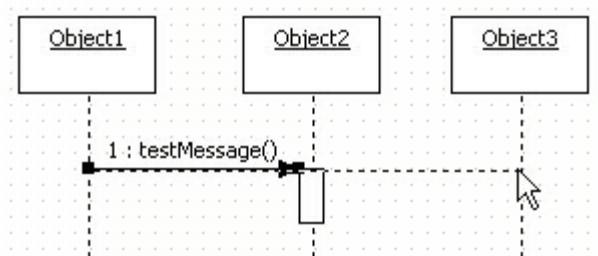
Procedure for reconnecting to another object

In order to reconnect stimulus to another object,

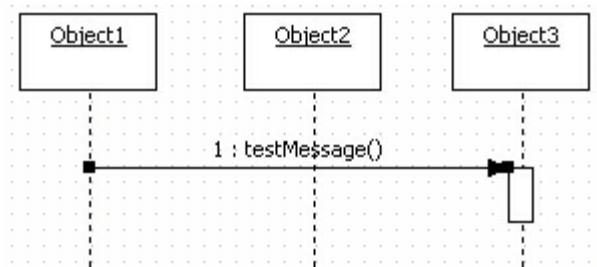
1. Click the end of stimulus.



2. Drag the end of stimulus and drop it to another object.



3. Then stimulus will be connected to another object.



Procedure for changing ActionKind of stimulus

The **[ActionKind]** property of stimulus should be assigned to one of five sort as following. To change **[ActionKind]** property, select stimulus and select the **[ActionKind]** property on the properties window.

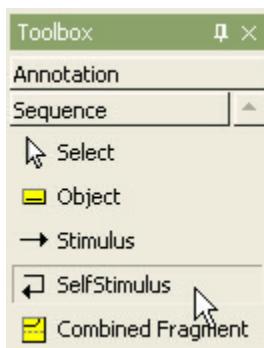
ActionKind	Shape
CALL	→
SEND	→
RETURN	→
CREATE	<<create>> →
DESTROY	<<destroy>> →

Self Stimulus

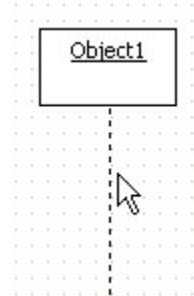
Procedure for creating self-stimulus

In order to create self-stimulus,

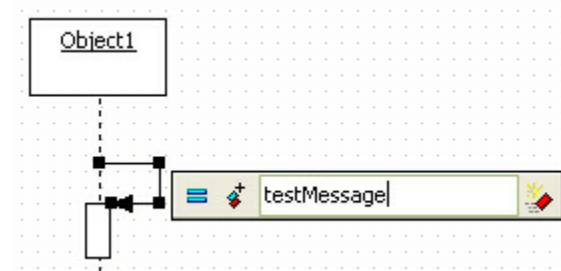
1. Click **[Toolbox] -> [Sequence] -> [SelfStimulus]** button.



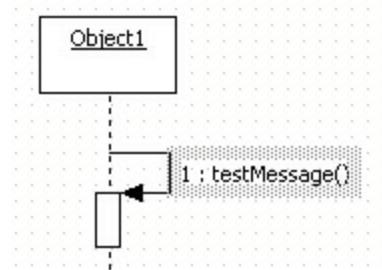
2. And click the object(or lifeline) that self-stimulus will be placed in the **[main window]**.



3. Object quick dialog is opened. At the quick dialog, enter the stimulus name and press **[Enter]** key.



4. The result of procedure is as follows. You may arrange stimulus position to reduce overlapping of text and line.

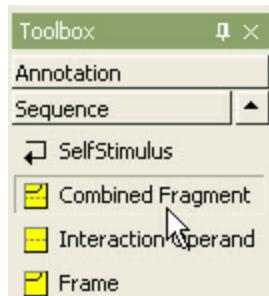


Combined Fragment

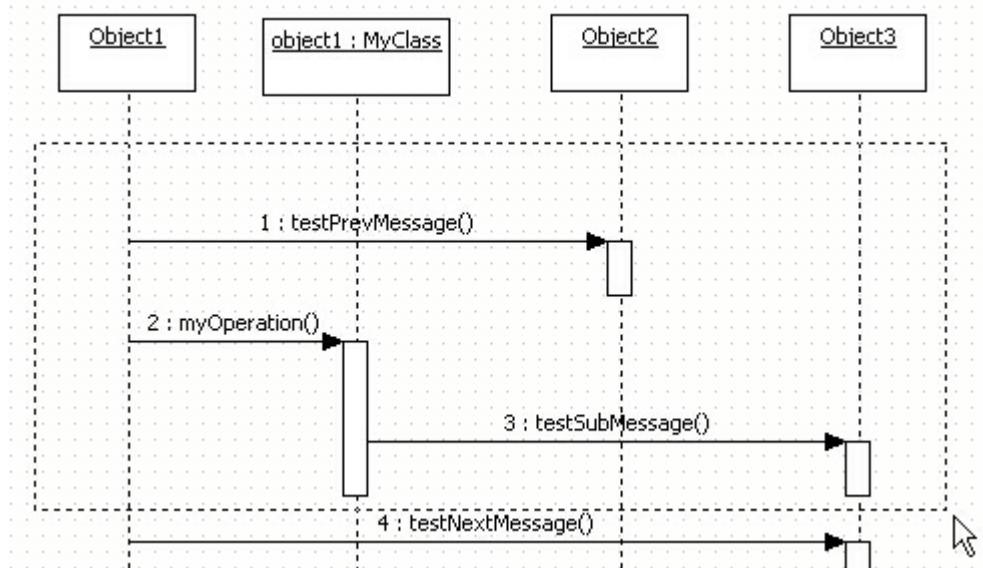
Procedure for creating combined fragment

In order to create Combined Fragment,

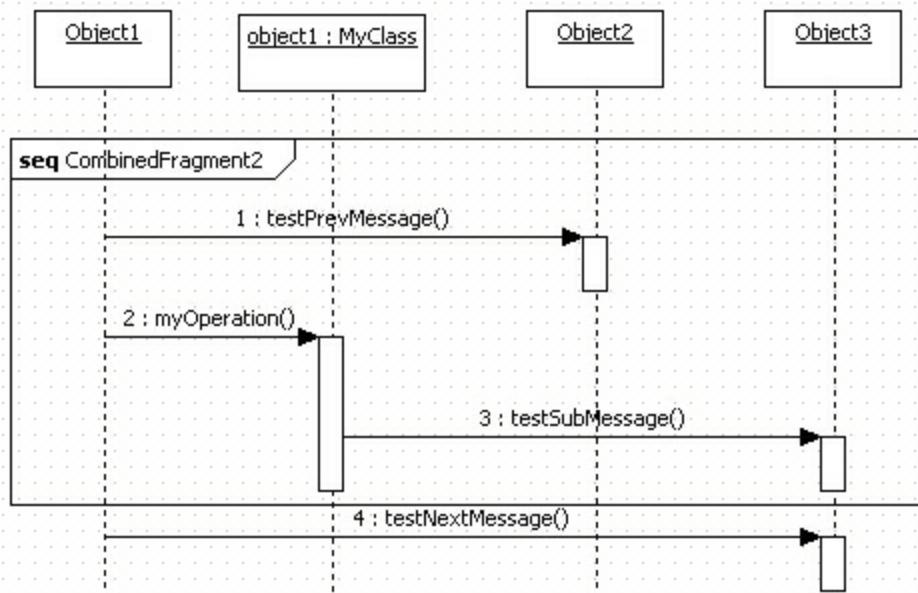
1. Click **[Toolbox] -> [Sequence] -> [Combined Fragment]** button.



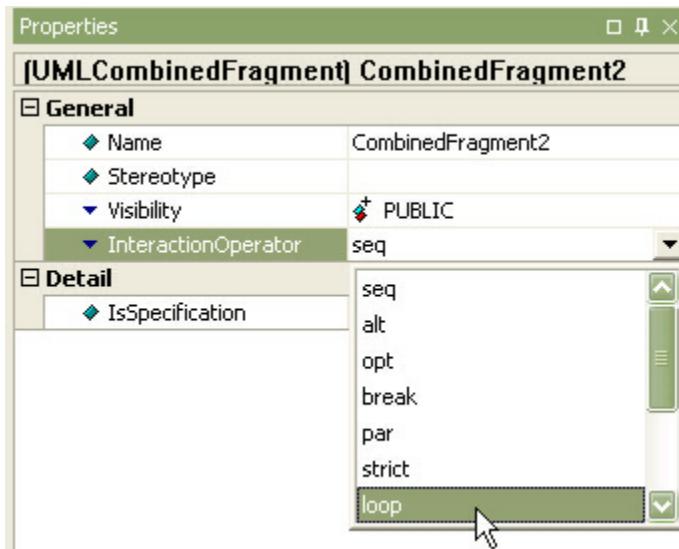
2. And click at the position where Combined Fragment will be placed in the [main window].



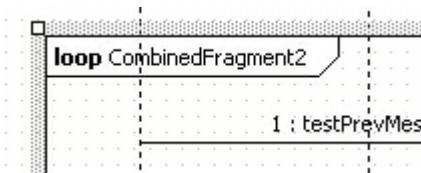
3. A combined fragment is created.



4. Change interaction operator in the properties as follows.



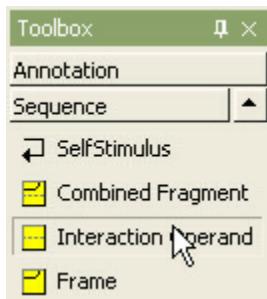
5. The combined fragment is shown as follows.



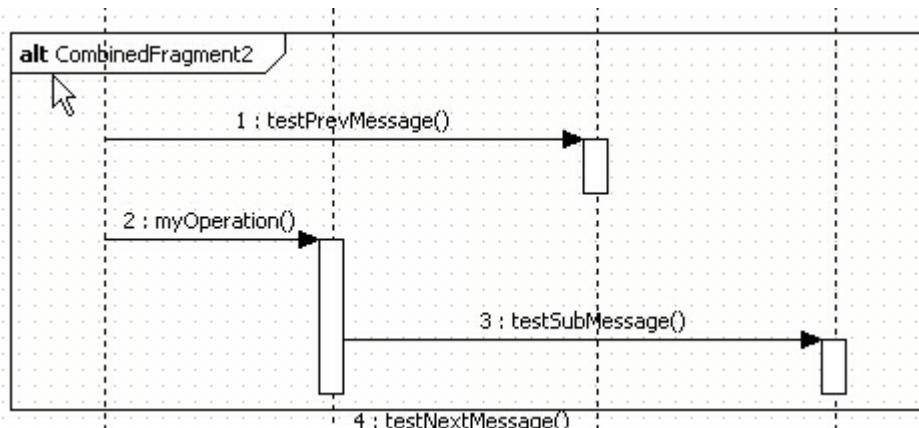
Procedure for creating interaction operand

In order to create Interaction Operand,

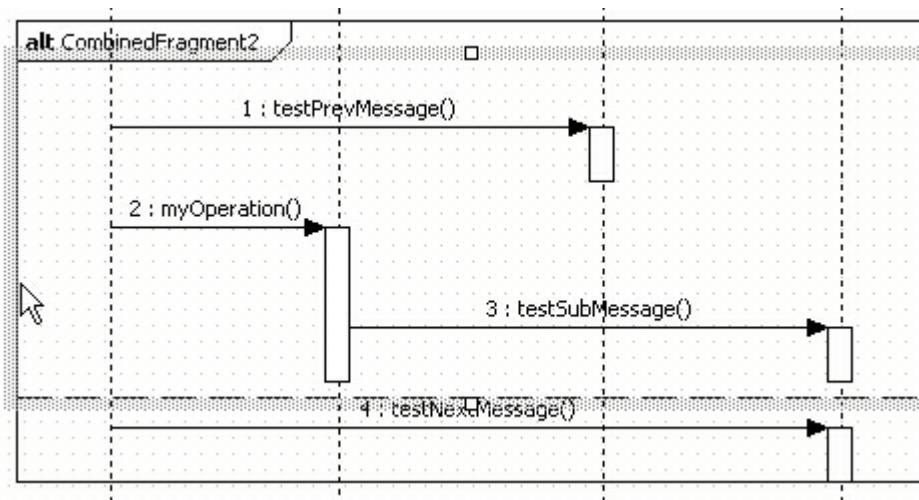
1. Click **[Toolbox] -> [Sequence] -> [Interaction Operand]** button.



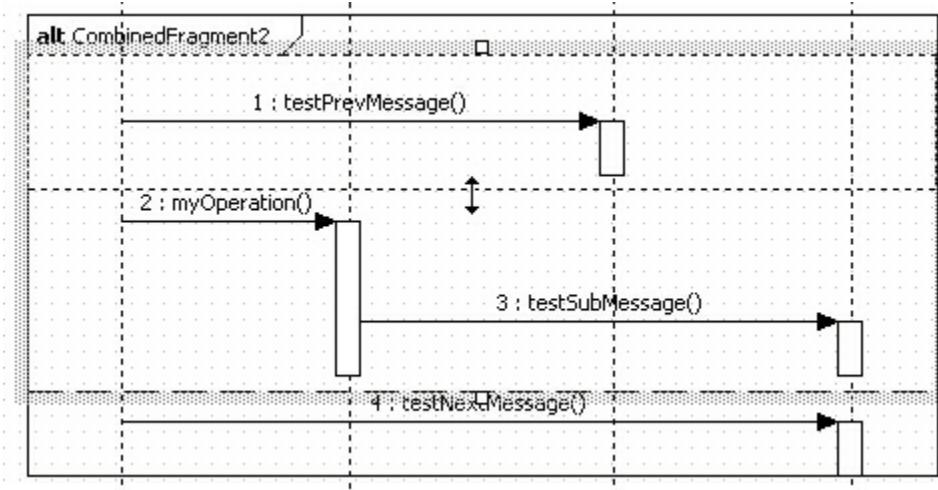
2. And click at the Combined Fragment where Interaction Operand will be placed in the **[main window]**.



3. New interaction operand is added to the combined fragment. Click the interaction operand.



4. The selection points of interaction operand are shown, drag it to arrange its boundary.

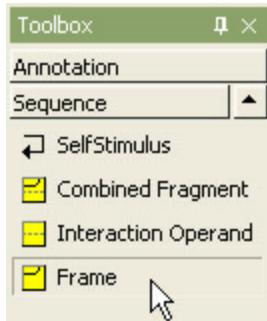


Frame

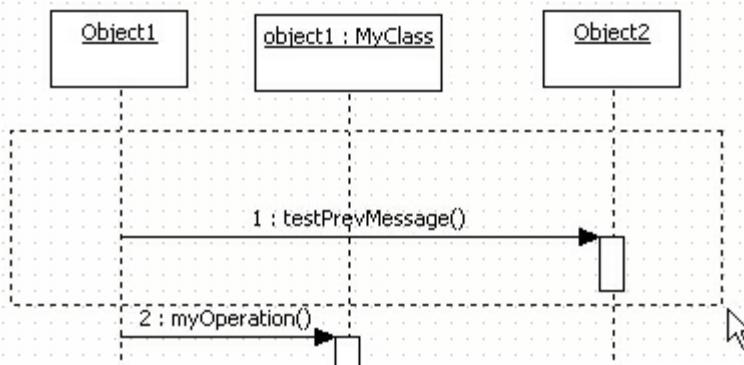
Procedure for creating frame

In order to create Frame,

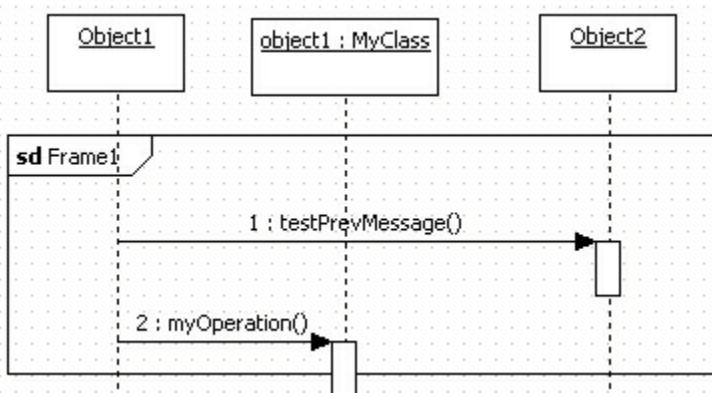
1. Click **[Toolbox] -> [Sequence] -> [Frame]** button.



2. And click at the position where Frame will be placed in the **[main window]**.



3.A new frame is created as follows.

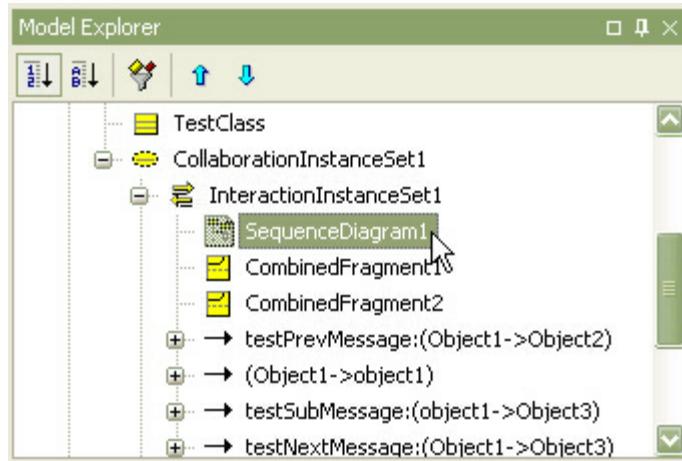


Sequence Numbers and Signature Style

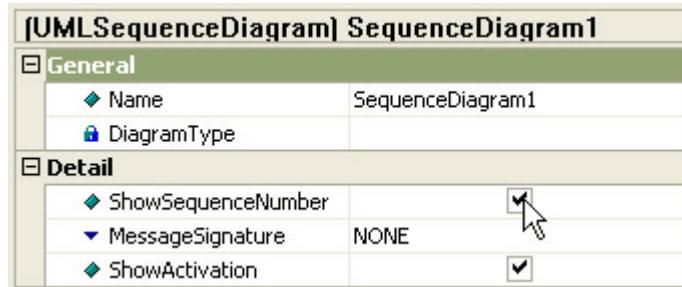
Procedure for showing sequence numbers in the diagram

In order to show or hide stimulus sequence number,

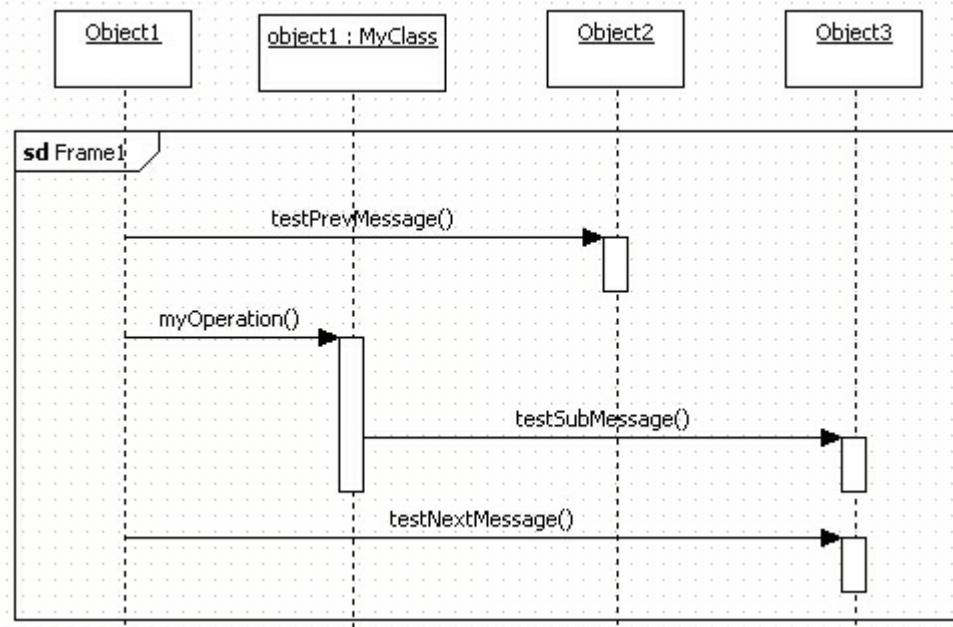
1. Select the diagram in the [model explorer] or in the [main window]



2.And configure **[ShowSequenceNumber]** property of diagram to true or false.

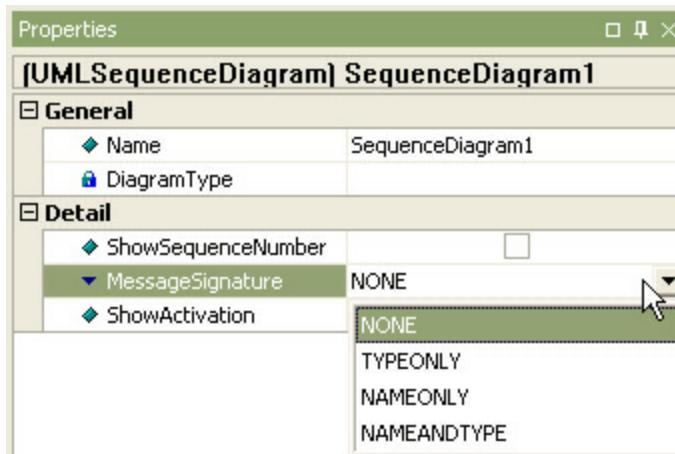


3.When **[ShowSequenceNumber]** is false, sequence diagram is shown as follows.



Procedure for changing signature style of message in the diagram

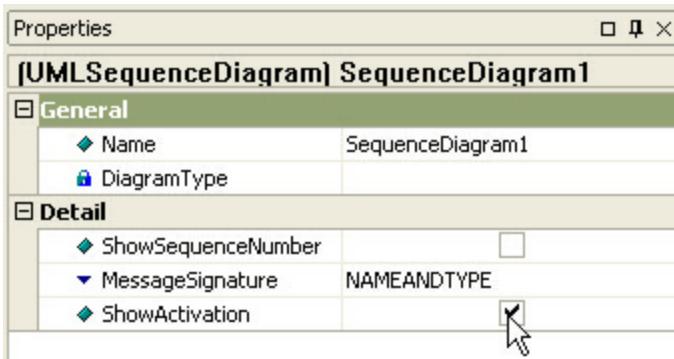
There are four message style. To change stimulus signature, select the diagram in the [model explorer] or in the [main window], and configure [MessageSignature] property of diagram to one of the followings.



Style	Example
NONE	myOperation()
NAMEONLY	myOperation(a)
TYPEONLY	myOperation(a): void
NAMEANDTYPE	myOperation(a): void

Procedure for changing activation style in the diagram

In order to show or hide stimulus activation, select the diagram in the [model explorer] or in the [main window], and configure [ShowActivation] property of diagram to true or false.



6.4 Collaboration Diagrams

The following elements are available in a collaboration diagram.

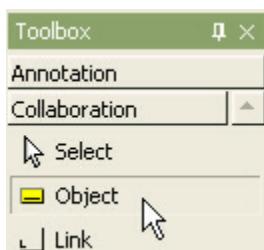
- Object
- Link
- Self Link
- Stimulus
- Frame
- Sequence Numbers
- Message Signature Style

Object

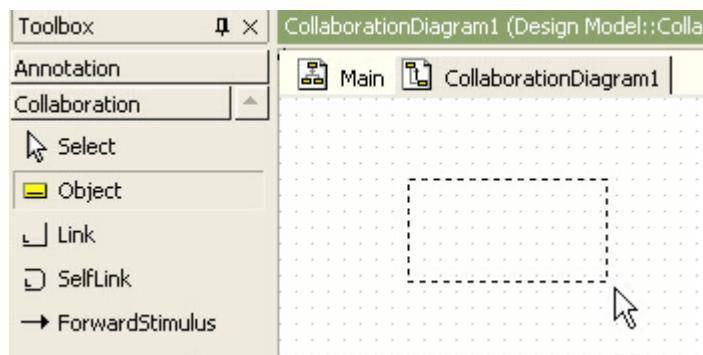
Procedure for creating object

In order to create Object,

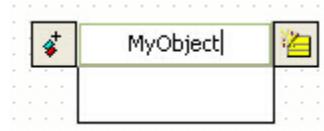
1. Click **[Toolbox] -> [Collaboration] -> [Object]** button.



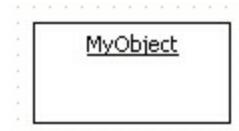
2. And click at the position where Object will be placed in the **[main window]**.



3. Then quick dialog is shown. At the quick dialog, enter the object name.



4. And press **[Enter]** key.



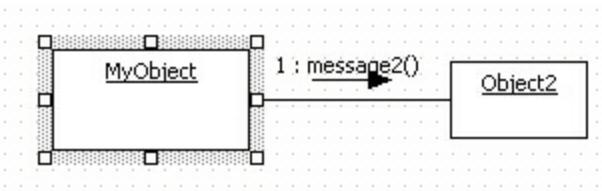
Procedure for creating outgoing from object stimulus by using shortcut creation syntax

In order to create outgoing stimulus from selected object to another object,

1. Double-click from-object, or select from-object and press **[Enter]** key to pop up quick dialog.
2. At the quick dialog, enter stimulus name after "->" string ("<-" string for incoming and "<->" for outgoing with return).



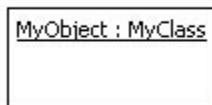
3. Press **[Enter]** key and outgoing stimulus from selected object to target object is created and placed at the last order.



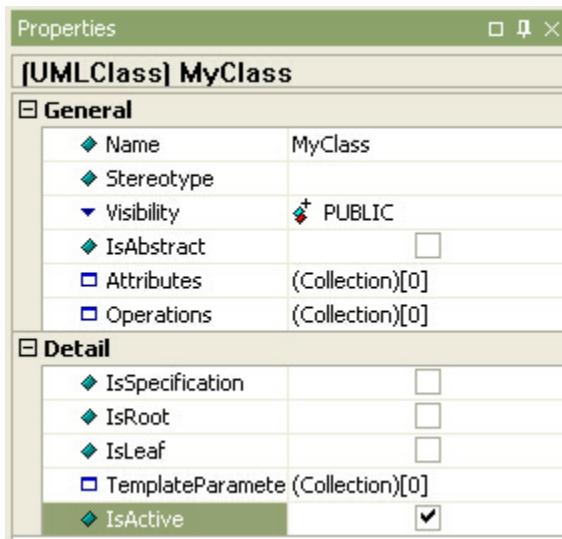
Procedure for setting active object

In order to set class to active object,

1. Set assigned class's **[IsActive]** property to true.



2. For MyObject, change MyClass's **[IsActive]** property.

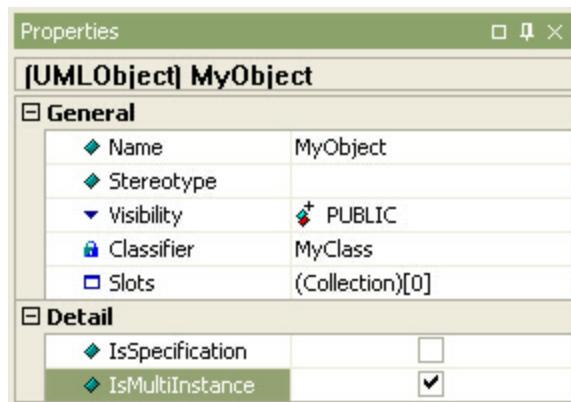


3. If class property is not assigned, you can't change object to active object.

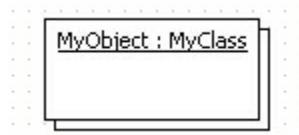
Procedure for setting to multi object

In order to set object to multi object,

1. Set object's **IsMultiInstance** property to true.



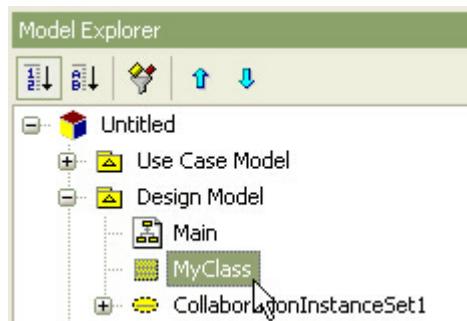
2. Then the object is assigned as multi object.



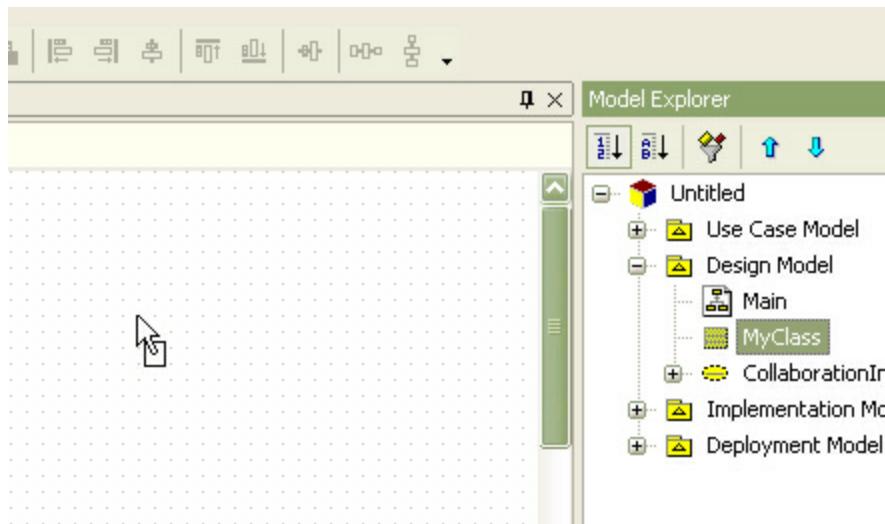
Procedure for creating object from class

In order to create object from class,

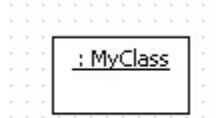
1. Select class in the [model explorer].



2. Drag it into collaboration diagram.



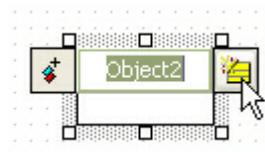
3. Then the object(instance of the class) is created.



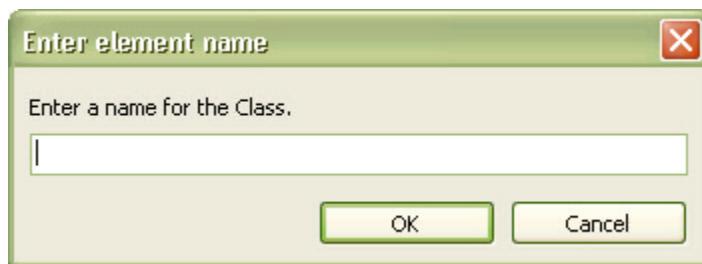
Procedure for creating class from object

If class is not assigned to object,

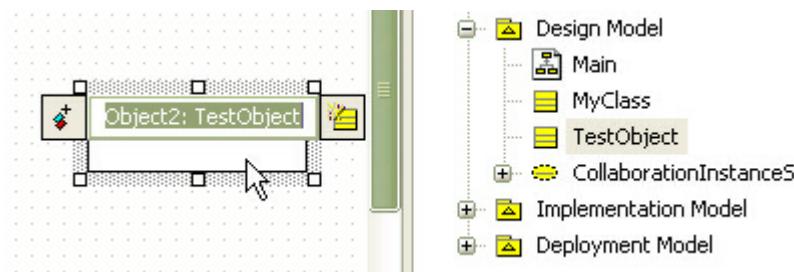
1. Double-click object to pop up quick dialog. Then quick dialog is opened.
2. At the quick dialog, click add class button.



3. At the [Enter element name] dialog, enter new class name.



4. Then new class is created and assigned to object.



If you want existing class to be assigned to object, enter the existing class name at the **[Select a model element]** dialog.

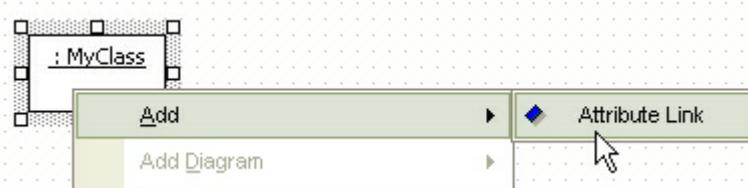
Procedure for adding AttributeLink to object

There are two way to add attribute link to Object.

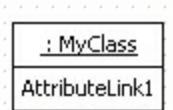
- using object model in the main diagram or the **[model explorer]**
- using **[collection editor]**

In the case of using object model,

1. Select object in the **[main window]** or in the **[model explorer]**.
2. Right-click the selected object, select **[Add] -> [Attribute Link]** popup menu, and you can add Attribute Link.

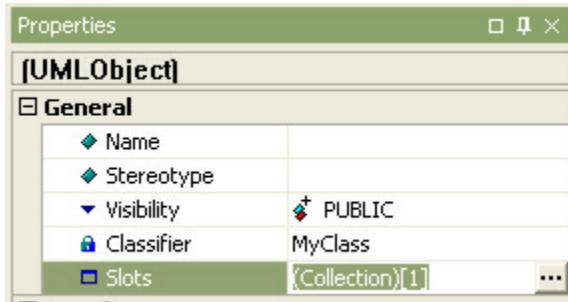


3. Then new attribute link is created.

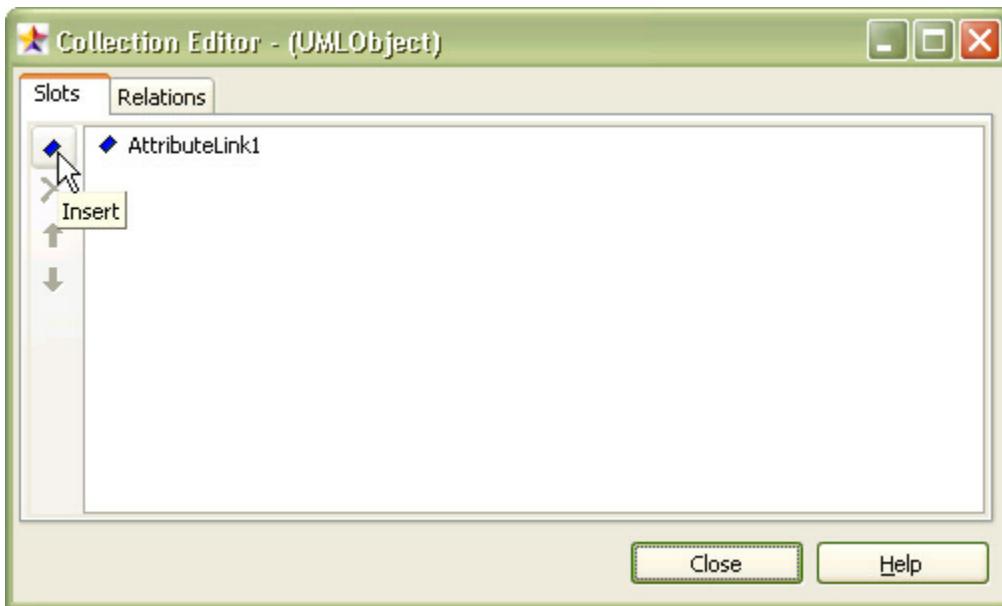


In the other case,

1. Select **[Collection Editor...]** popup menu of object or click  button in **[Slots]** property on properties window.



2. At slots tab of the **[collection editor]**, you can add attribute link by using  button.

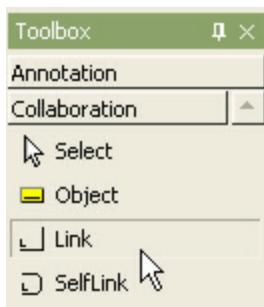


Link

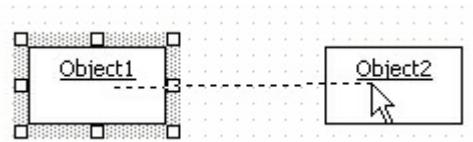
Procedure for creating link

In order to create Link,

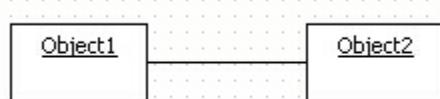
1. Click **[Toolbox] -> [Collaboration] -> [Link]** button.



2. Drag from one Object and drop to the other Object in the **[main window]**.



3. Between two objects, the link is created.

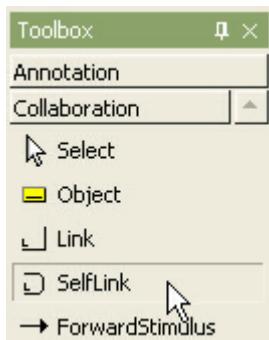


Self Link

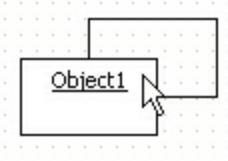
Procedure for creating self-link

In order to create self-link,

1. Click **[Toolbox] -> [Collaboration] -> [SelfLink]** button.



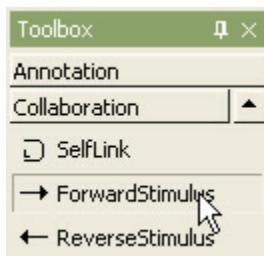
2. And click the object that self-link will connect to in the **[main window]**.



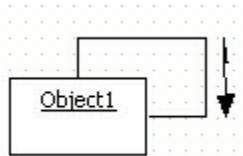
Procedure for creating self-stimulus

In order to create self-stimulus,

1. Click **[Toolbox] -> [Collaboration] -> [ForwardStimulus/ReverseStimulus]** button.



2. And click the self-link that the stimulus will be placed in the **[main window]**.



3. And double-click the stimulus, enter the stimulus name at the quick dialog.

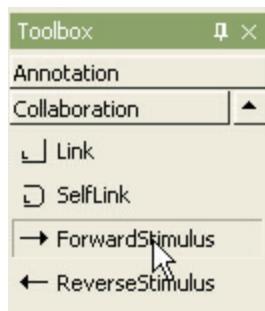


Stimulus

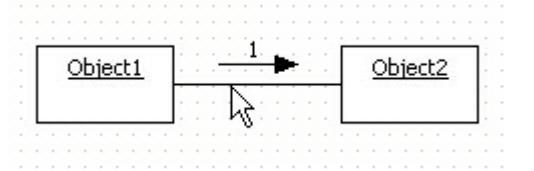
Procedure for creating stimulus

In order to create stimulus,

1. Click **[Toolbox] -> [Collaboration] -> [ForwardStimulus/ReverseStimulus]** button.



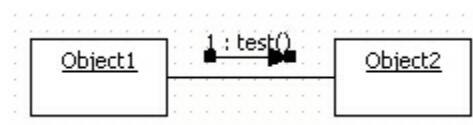
2. Click the link that the stimulus will be placed in the [main window].



3. And double-click the stimulus, enter the stimulus name at the quick dialog.

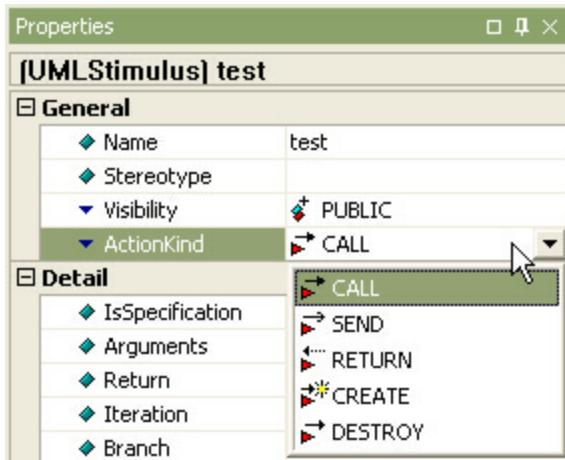


4. The result is as follows.



Procedure for changing ActionKind of stimulus

The **[ActionKind]** property of stimulus should be assigned to one of five sort as following. To change **[ActionKind]** property, select stimulus and select the **[ActionKind]** property on the properties window.



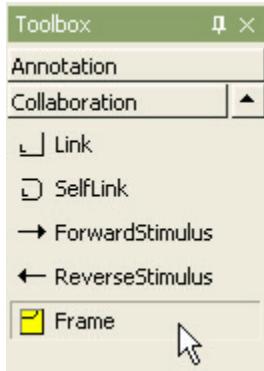
ActionKind	Shape
CALL	→
SEND	→
RETURN	↔
CREATE	<<create>> →
DESTROY	<<destroy>> →

Frame

Procedure for creating frame

In order to create Frame,

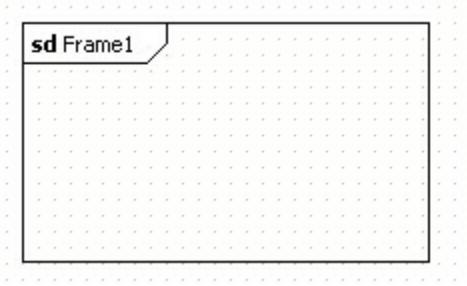
1. Click [Toolbox] -> [Collaboration] -> [Frame] button.



2. And click at the position where Frame will be placed in the **[main window]**.



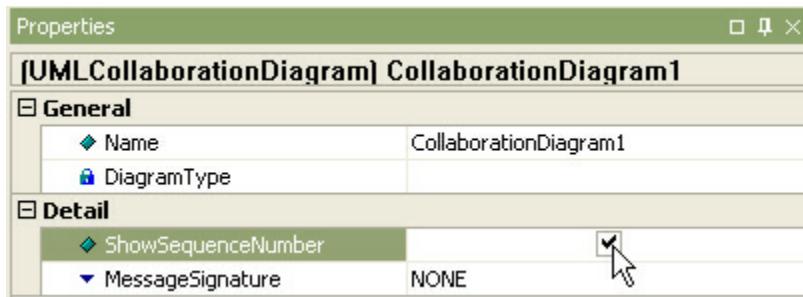
3. The result is as follows.



Sequence Numbers and Signature Style

Procedure for showing sequence numbers in the diagram

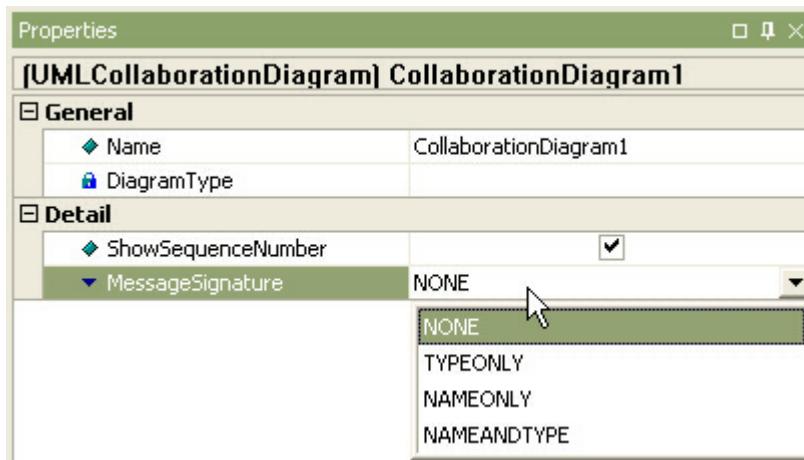
In order to show or hide stimulus sequence number, select the diagram in the **[model explorer]** or in the **[main window]**, and configure **[ShowSequence]** property of diagram to true or false.



Procedure for changing signature style of message in the diagram

There are four message style. To change stimulus signature,

1. Select the diagram in the [model explorer] or in the [main window].



2. And configure [MessageSignature] property of diagram to one of the followings.

Style	Description
NONE	shows only message name
NAMEONLY	shows message name and argument name
TYPEONLY	shows message name, argument type, and return type
NAMEANDTYPE	shows message name, argument name, argument type, and return type

6.5 State Diagrams

The following elements are available in a state diagram.

- State
- Submachine State
- Initial State
- Final State
- Junction Point
- Choice Point
- Shallow History
- Deep History

- Synchronization
- Flow Final
- Transition
- Self Transition

State

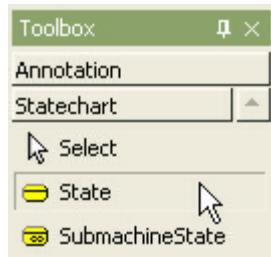
Semantics

A state is a condition during the life of an object or an interaction during which it satisfies some condition, performs some action, or waits for some event.

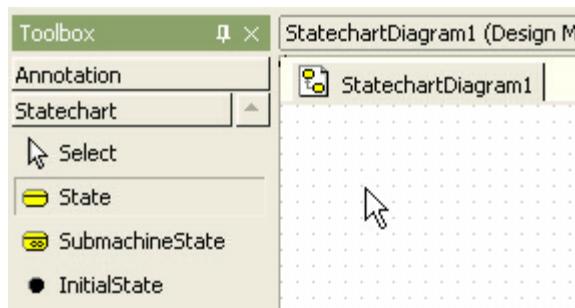
Procedure for creating state

In order to create State,

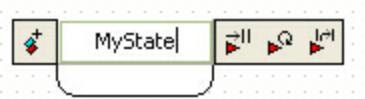
1. Click **[Toolbox] -> [Statechart] -> [State]** button.



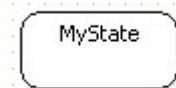
2. And click at the position where State will be placed in the **[main window]**.



3. A state is created and quick dialog appears. Enter the state name at the quick dialog .



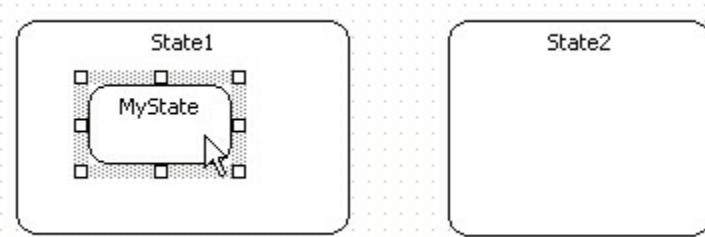
4. And press [**Enter**] key to have done this procedure.



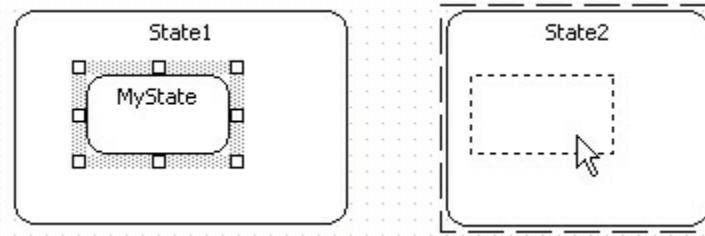
Procedure for moving state into another state

In order to move a state into another state,

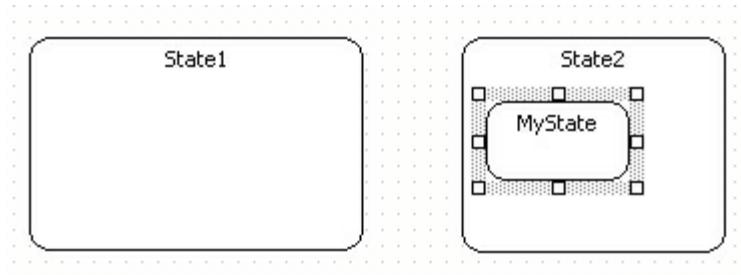
1. Click a state that is contained in some state.



2. Drag it into another state.



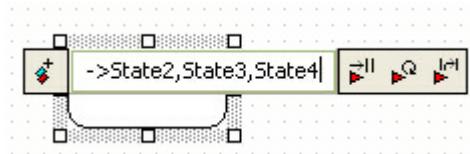
3. The selected state is move into another state.



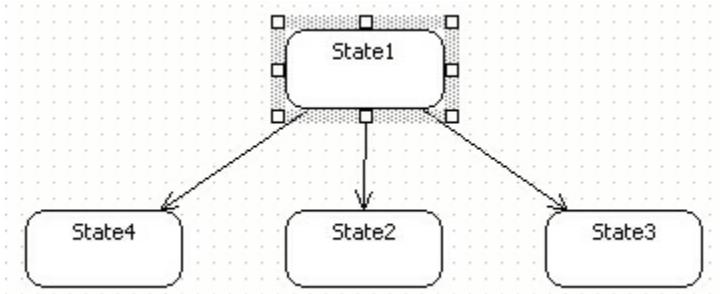
Procedure for transitioning to multiple states at once

In order to create states with incoming or outgoing transition from selected state at once, use shortcut creation syntax.

1. Double-click state. Then quick dialog is shown. At the quick dialog, After "->" string(or "<- " string for incoming), enter target state names, and separate state names by "," character.



2. And press [**Enter**] key. Several states outgoing(incoming) from selected state are created and arranged automatically.



Procedure for adding entry/do/exit action

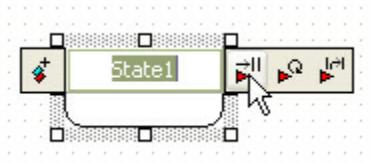
There are three way to add action to state.

- using quick dialog
- using model in the [**main window**] or the [**model explorer**]
- using [**collection editor**]

In the case of using quick dialog,

1. Double-click state.

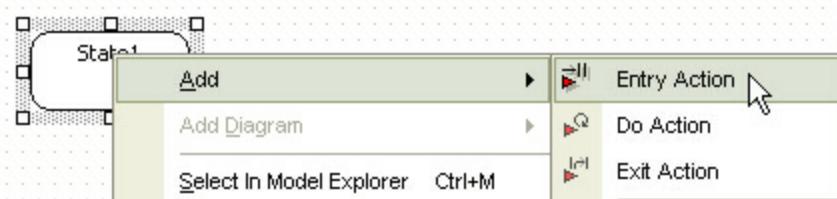
2. At the quick dialog, press [**Add Entry/Add DoAction/Add ExitAction**] button at the quick dialog.



3. And you can add action.

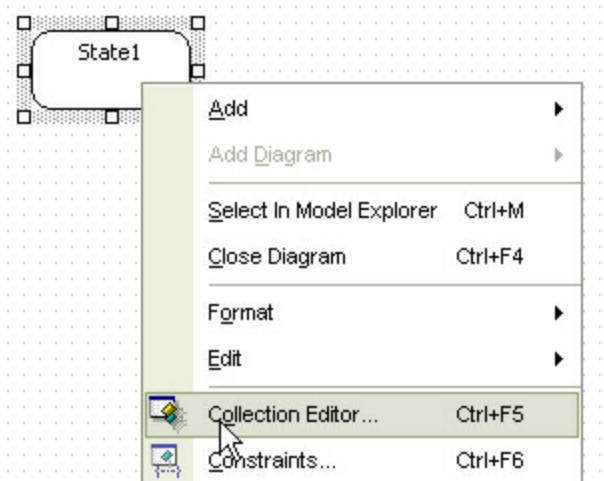


In the case of using model, select state in the [**main window**] or in the [**model explorer**]. Right-click the selected state, select [**Add**] -> [**Entry/Do/Exit**] popup menu. And you can do.

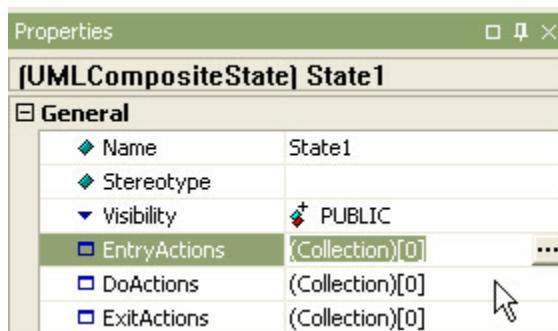


In the last case,

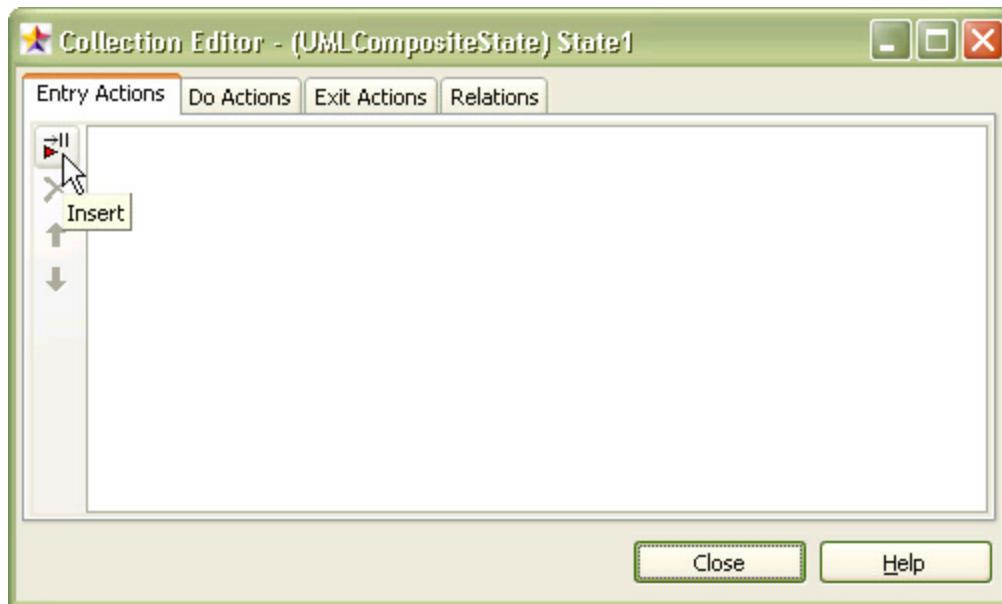
1. select [**Collection Editor...**] popup menu of state.



2. Or click button in [**EntryActions/DoActions/ExitActions**] property on properties window.



3. At [**Entry Actions/Do Actions/Exit Actions**] tab of the [**collection editor**], you can add action by using button.



Submachine State

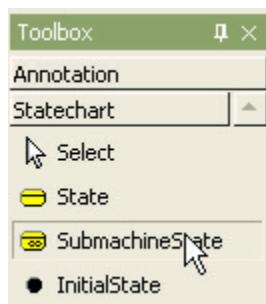
Semantics

A submachine state is a syntactical convenience that facilitates reuse and modularity. It is a shorthand that implies a macro-like expansion by another state machine and is semantically equivalent to a composite state.

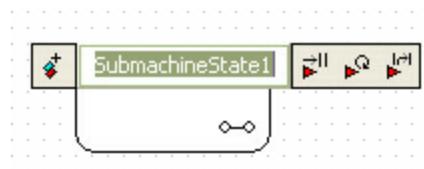
Procedure for creating submachine state

In order to create SubmachineState,

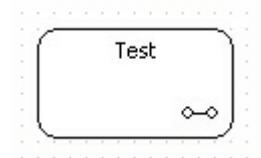
1. Click **[Toolbox] -> [Statechart] -> [SubmachineState]** button.



2. And click at the position where SubmachineState will be placed in the **[main window]**. A submachine state is created and quick dialog is opened.



3. At the quick dialog, enter the submachine state name and press [Enter] key.



Initial State

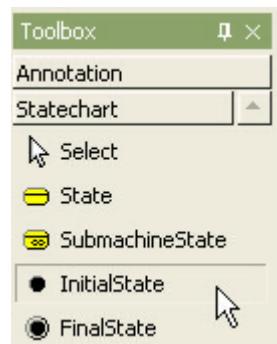
Semantics

An initial is a kind of pseudostate that represents the starting point in a region of a state machine. It has a single outgoing transition to the default state of the enclosing region, and has no incoming transitions. There can be one (and only one) initial state in any given region of a state machine. It is not itself a state but acts as a marker.

Procedure for creating initial state

In order to create InitialState,

1. Click **[Toolbox] -> [Statechart] -> [InitialState]** button.



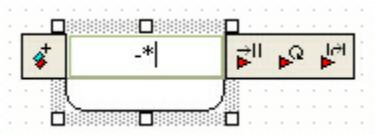
2. And click at the position where InitialState will be placed in the **[main window]**.



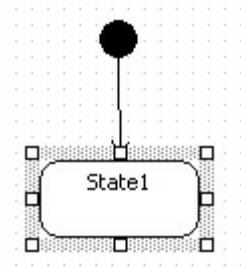
Procedure for creating initial state from state

In order to create initial state with outgoing transition to selected object, use shortcut creation syntax.

1. Double-click state. At the quick dialog, After "-*" string, enter initial state name or none.



2. Press **[Enter]** key and initial state with outgoing transition to selected state is created.

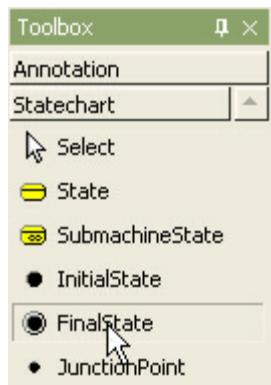
**Final State****Semantics**

A final state represents the last or "final" state of the enclosing composite state. There may be more than one final state at any level signifying that the composite state can end in different ways or conditions. When a final state is reached and there are no other enclosing states it means that the entire state machine has completed its transitions and no more transitions can occur.

Procedure for creating final state

In order to create FinalState,

1. Click **[Toolbox] -> [Statechart] -> [FinalState]** button.



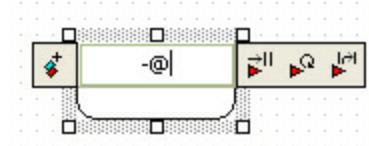
2. And click at the position where FinalState will be placed in the [main window].



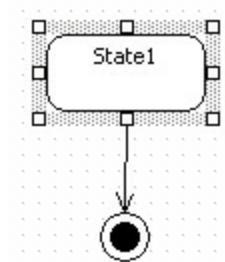
Procedure for creating final state from state

In order to create final state with outgoing transition from selected object, use shortcut creation syntax.

1. Double-click state. At the quick dialog, After "-@" string, enter final state name or none.



2. Press [**Enter**] key and final state with ingoing transition from selected state is created.



Junction Point

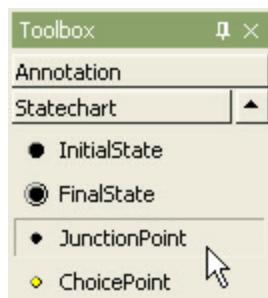
Semantics

A junction point chains transitions into a single run-to-completion path. May have multiple input and/or output transitions. Each complete path involving a junction is logically independent and only one such path fires at one time. May be used to construct branches and merges.

Procedure for creating junction point

In order to create JunctionPoint,

1. Click **[Toolbox] -> [Statechart] -> [JunctionPoint]** button.



2. And click at the position where JunctionPoint will be placed in the **[main window]**.



Choice Point

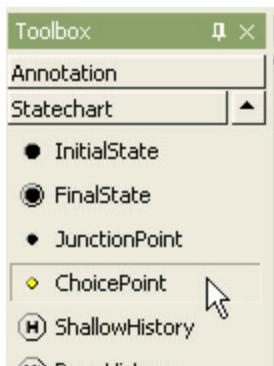
Semantics

A choice point splits an incoming transition into several disjoint outgoing transitions. Each outgoing transition has a guard condition that is evaluated after prior actions on the incoming path have been completed. At least one outgoing transition must be enabled or the model is ill formed.

Procedure for creating choice point

In order to create ChoicePoint,

1. Click **[Toolbox] -> [Statechart] -> [ChoicePoint]** button.



2. And click at the position where ChoicePoint will be placed in the [main window].



Shallow History

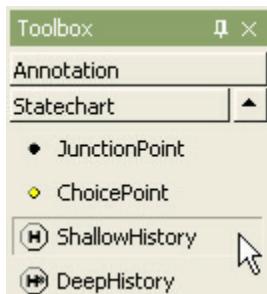
Semantics

When reached as the target of a transition, shallow history restores the state within the enclosing composite state that was active just before the enclosing state was last exited. Does not restore any substates of the last active state.

Procedure for creating shallow history

In order to create ShallowHistory,

1. Click **[Toolbox] -> [Statechart] -> [ShallowHistory]** button.



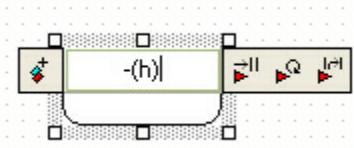
2. And click at the position where ShallowHistory will be placed in the [main window].



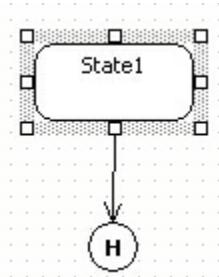
State History State:**Procedure for creating final state from state**

In order to create history with outgoing transition from selected object, use shortcut creation syntax.

1. Double-click state. At the quick dialog, enter one of "-(h)", "-(H)", "-(h*)", "-(H*)" string.



2. Press **[Enter]** key and history with outgoing transition from selected state is created.

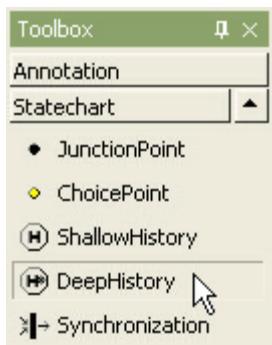
**Deep History****Semantics**

When reached as the target of a transition, deep history restores the full state configuration that was active just before the enclosing composite state was last exited.

Procedure for creating deep history

In order to create DeepState,

1. Click **[Toolbox] -> [Statechart] -> [DeepState]** button.



2. And click at the position where DeepState will be placed in the [main window].

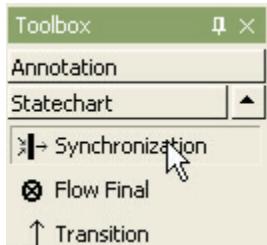


Synchronization

Procedure for creating synchronization bar

In order to create Synchronization,

1. Click [Toolbox] -> [Statechart] -> [Synchronization] button.



2. And click at the position where Synchronization will be placed in the [main window].

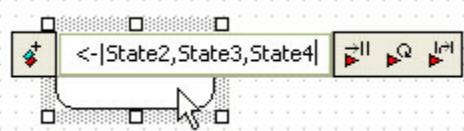


Procedure for creating join

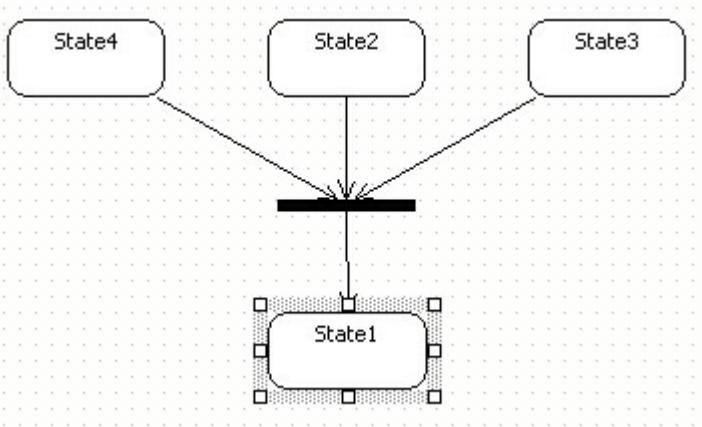
In order to create incoming join transition to selected object, use shortcut creation syntax.

1. Double-click state. At the quick dialog, enter "<-|" and state names to be joined, and

separate state names by "," character.



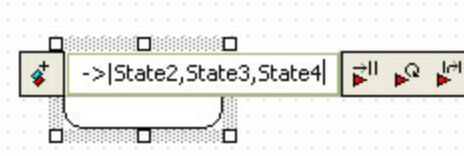
2. Press **[Enter]** key and states joined to selected state is created and arranged automatically.



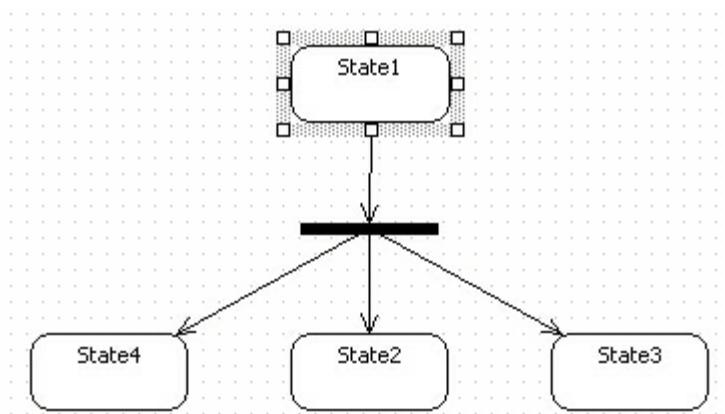
Procedure for creating join

In order to create outgoing fork transition to selected object, use shortcut creation syntax.

1. Double-click state. At the quick dialog, enter "->|" and state names to be forked, and separate state names by "," character.



2. Press **[Enter]** key and states forked from selected state is created and arranged automatically.

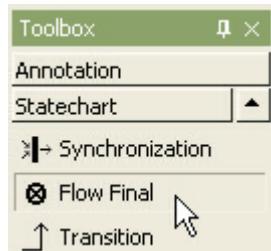


Flow Final

Procedure for creating flow final

In order to create Flow Final,

1. Click [Toolbox] -> [Statechart] -> [Flow Final] button.



2. And click at the position where Flow Final will be placed in the [main window].



Transition

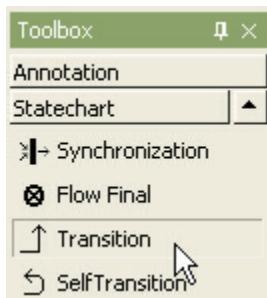
Semantics

A transition is a directed relationship between a source state vertex and a target state vertex. It may be part of a compound transition, which takes the state machine from one state configuration to another, representing the complete response of the state machine to a particular event instance.

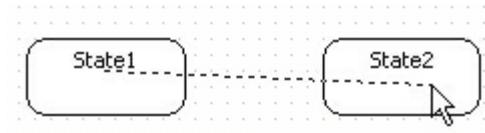
Procedure for creating transition

In order to create Transition,

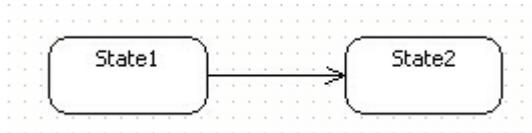
1. Click **[Toolbox] -> [Statechart] -> [Transition]** button.



2. Drag and drop between states in transition direction in the **[main window]**.



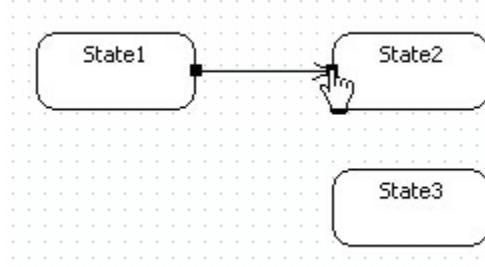
3. Between two states, a transition is created.



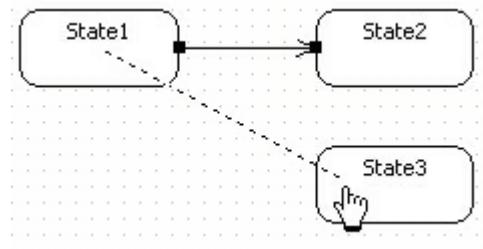
Procedure for reconnecting to another element

In order to reconnect to another state,

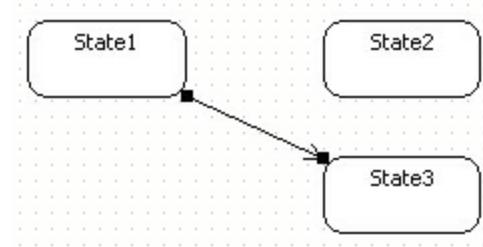
1. Click the end of transition.



2. Drag and drop it into another state.



3. Then transition's end will be changed.



Self Transition

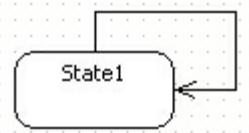
Procedure for creating self-transition

In order to create self-transition,

1. Click **[Toolbox] -> [Statechart] -> [SelfTransition]** button.



2. Click state to have self-transition in the **[main window]**.



6.6 Activity Diagrams

The following elements are available in a activity diagram.

- Action State
- Subactivity State
- Initial State
- Final State
- Synchronization
- Decision
- Flow Final
- Object Flow
- Signal Accept State
- Signal Send State
- Transition
- Self Transition
- Swim lane

Action State

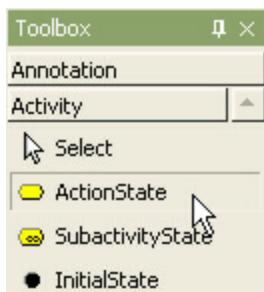
Semantics

An action state represents the execution of an atomic action, typically the invocation of an operation. An action state is a simple state with an entry action whose only exit transition is triggered by the implicit event of completing the execution of the entry action. The state therefore corresponds to the execution of the entry action itself and the outgoing transition is activated as soon as the action has completed its execution.

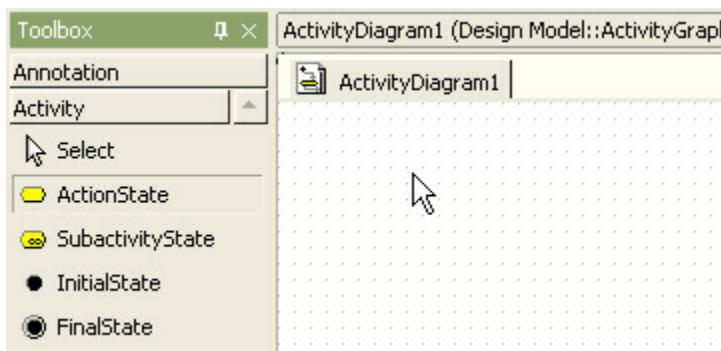
Procedure for creating action state

In order to create ActionState,

1. Click **[Toolbox] -> [Activity] -> [ActionState]** button.



2. And click at the position where ActionState will be placed in the **[main window]**.



3. A action state is created on the diagram and the quick dialog is shown.



4. Enter the action state name at the quick dialog and press **[Enter]** key. The result is as follows.



Subactivity State

Semantics

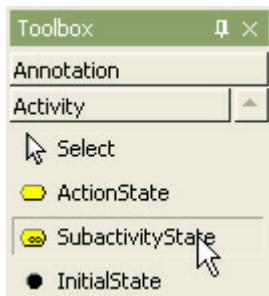
A subactivity state represents the execution of a non-atomic sequence of steps that has some duration; that is, internally it consists of a set of actions and possibly waiting for

events. That is, a subactivity state is a “hierarchical action,” where an associated subactivity graph is executed.

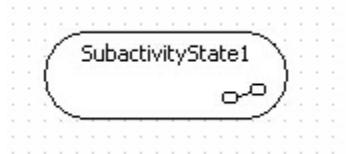
Procedure for creating subactivity state

In order to create SubactivityState,

1. Click **[Toolbox] -> [Activity] -> [SubactivityState]** button.



2. And click at the position where SubactivityState will be placed in the **[main window]**. A subactivity state is created and the quick dialog is shown. At the quick dialog, enter the subactivity state name and press **[Enter]** key. The result is as follows.



Initial State

Procedure for creating initial state

In order to create InitialState,

1. Click **[Toolbox] -> [Activity] -> [InitialState]** button.



2. And click at the position where InitialState will be placed in the [main window]. Then a initial state is created.



Final State

Procedure for creating final state

In order to create FinalState,

1. Click **[Toolbox] -> [Activity] -> [FinalState]** button.



2. And click at the position where FinalState will be placed in the [main window].



Decision

Semantics

A state diagram (and by derivation an activity diagram) expresses a decision when guard conditions are used to indicate different possible transitions that depend on Boolean conditions of the owning object.

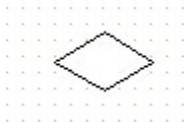
Procedure for creating decision

In order to create Decision,

1. Click **[Toolbox] -> [Activity] -> [Decision]** button.



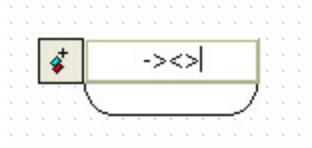
2. And click at the position where Decision will be placed in the **[main window]**. The decision is created on the diagram.



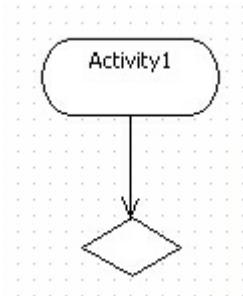
Procedure for creating decision from state

In order to create decision with incoming transition from selected object, use shortcut creation syntax.

1. Double-click state. At the quick dialog, enter "-><>"("<->" for incoming from decision) string.



2. Press **[Enter]** key and decision with outgoing transition from selected state is created.



Flow Final

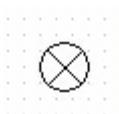
Procedure for creating flow final

In order to create Flow Final,

1. Click **[Toolbox] -> [Activity] -> [Flow Final]** button.



2. And click at the position where Flow Final will be placed in the **[main window]**.



Object Flow

Semantics

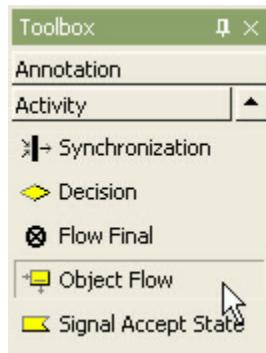
An object flow is one of two types of activity edges, which are directed connection (flows) between activity nodes, the other being a control flow. As soon as the activity node at the source (tail) end of the flow is finished it presents tokens to the object flow at the target (arrowhead) end of the flow. An object flow can only carry object (data) tokens; it cannot carry control tokens. There are rules that specify whether tokens can flow along the object flow and these are determined by the

type of activity node at the source and target of the flow. In the case of complete activities an object flow may define a weight, which specifies the minimum number of tokens that must flow along the object flow as a group.

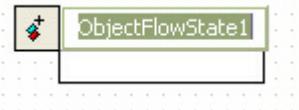
Procedure for creating object flow

In order to create Object Flow,

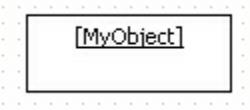
1. Click **[Toolbox] -> [Activity] -> [Object Flow]** button.



2. And click at the position where Object Flow will be placed in the **[main window]**. Then the quick dialog of object flow state is shown as follows.



3. At the quick dialog, enter the object flow state name and press **[Enter]** key.

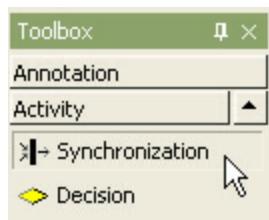


Synchronization

Procedure for creating synchronization bar

In order to create Synchronization,

1. Click **[Toolbox] -> [Activity] -> [Synchronization]** button.



2. And click at the position where Synchronization will be placed in the **[main window]** and drag as size as you want.



3. The following figure shows the result of this procedure.



Signal Accept State

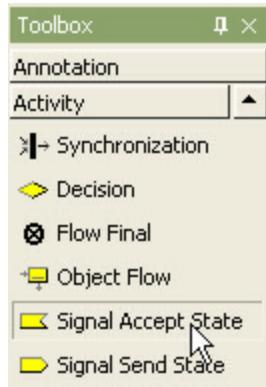
Semantics

The signal accept may be shown as a concave pentagon that looks like a rectangle with a triangular notch in its side (either side). The signature of the signal is shown inside the symbol. An unlabeled transition arrow is drawn from the previous action state to the pentagon and another unlabeled transition arrow is drawn from the pentagon to the next action state. A dashed arrow may be drawn from an object symbol to the notch on the pentagon to show the sender of the signal; this is optional.

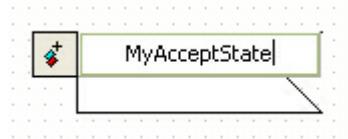
Procedure for creating signal accept state

In order to create Signal Accept State,

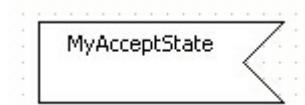
1. Click **[Toolbox] -> [Activity] -> [Signal Accept State]** button.



2. And click at the position where Signal Accept State will be placed in the **[main window]**.



3. At the quick dialog, enter signal accept state name and press **[Enter]** key.



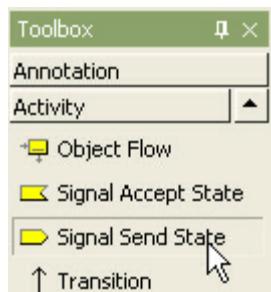
Signal Send State

The sending of a signal may be shown as a convex pentagon that looks like a rectangle with a triangular point on one side (either side). The signature of the signal is shown inside the symbol. An unlabeled transition arrow is drawn from the previous action state to the pentagon and another unlabeled transition arrow is drawn from the pentagon to the next action state. A dashed arrow may be drawn from the point on the pentagon to an object symbol to show the receiver of the signal, this is optional.

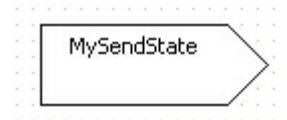
Procedure for creating signal send state

In order to create Signal Send State,

1. Click **[Toolbox] -> [Activity] -> [Signal Send State]** button.



2. And click at the position where Signal Send State will be placed in the [main window]. A signal send state is created and the quick dialog is shown. Enter signal send state name and press [**Enter**] key.

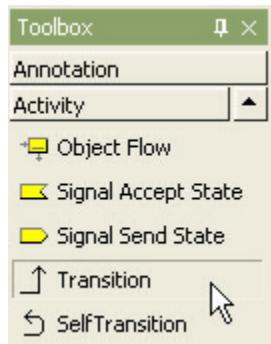


Transition

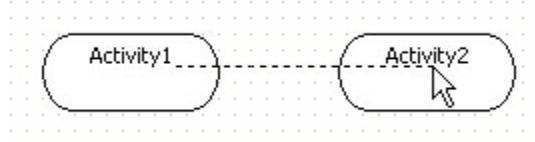
Procedure for creating transition

In order to create Transition,

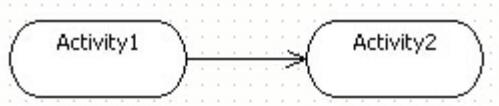
1. Click [**Toolbox**] -> [**Activity**] -> [**Transition**] button.



2. Drag and drop between states in transition direction in the [**main window**].



3. Then the transition is created.



Self Transition

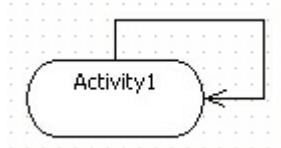
Procedure for creating self-transition

In order to create self-transition,

1. Click **[Toolbox] -> [Activity] -> [SelfTransition]** button.



2. Click state to have self-transition in the **[main window]**. Then a self-transition is created.



Swim lane

Semantics

Actions and subactivities may be organized into swimlanes. Swimlanes are used to organize responsibility for actions and subactivities. They often correspond to organizational units in a business model.

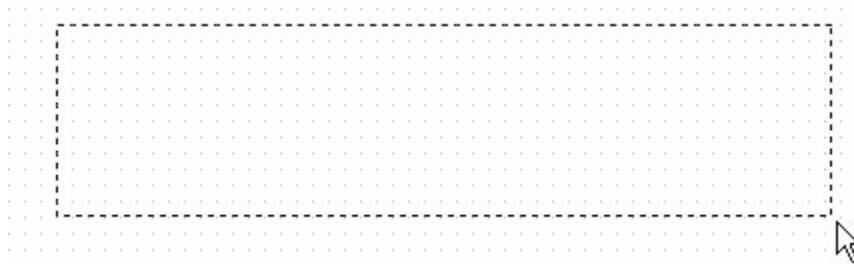
Procedure for creating horizontal swimlane

In order to create Horizontal Swimlane,

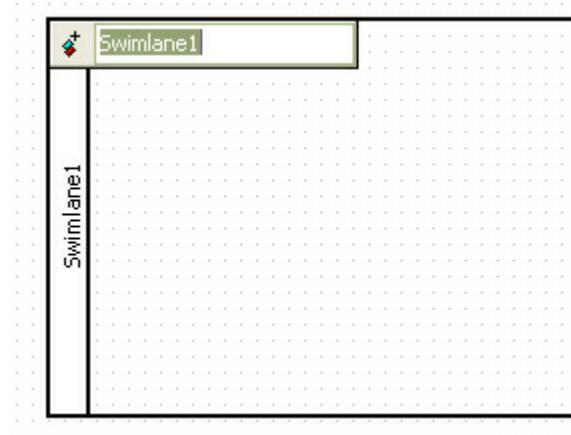
1. Click **[Toolbox] -> [Activity] -> [Horizontal Swimlane]** button.



2. And drag the boundary where Horizontal Swimlane will be placed in the [main window].



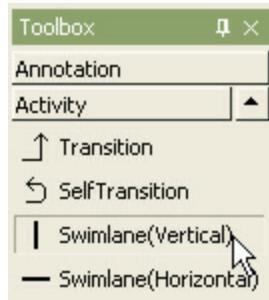
3. Then a horizontal swimlane is created on the diagram. And enter the swimlane name at the quick dialog and press [Enter] key.



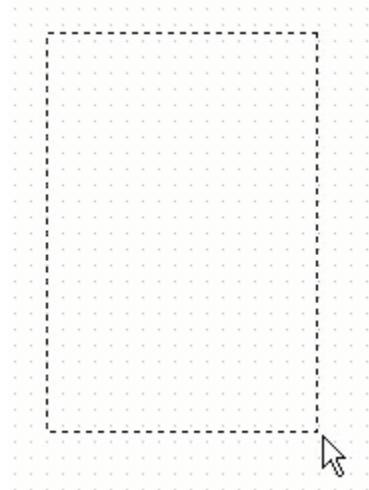
Procedure for creating vertical swimlane

In order to create Vertical Swimlane,

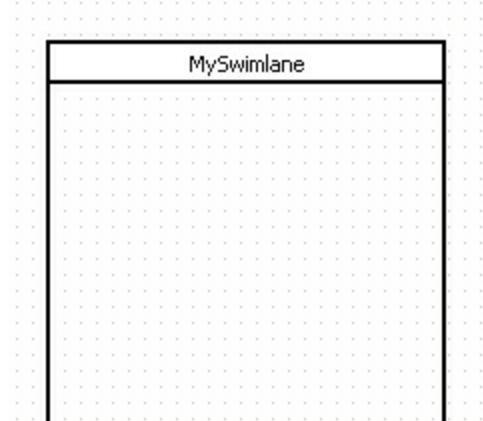
1. Click [Toolbox] -> [Activity] -> [Vertical Swimlane] button.



2. And drag the boundary where Vertical Swimlane will be placed in the [**main window**].



3. A swimlane is created and quick dialog is shown. At the quick dialog, enter the swimlane name and press [**Enter**] to have done this procedure.



6.7 Component Diagrams

The following elements are available in a component diagram.

- Package
- Interface
- Component
- Component Instance
- Artifact
- Port
- Part
- Association
- Dependency
- Realization
- Link
- Connector

Package

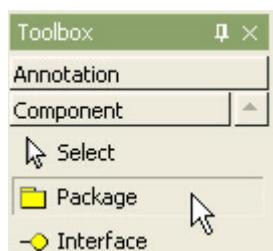
Semantics

A package is a grouping of model elements. Packages themselves may be nested within other packages. A package may contain subordinate packages as well as other kinds of model elements. All kinds of UML model elements can be organized into packages.

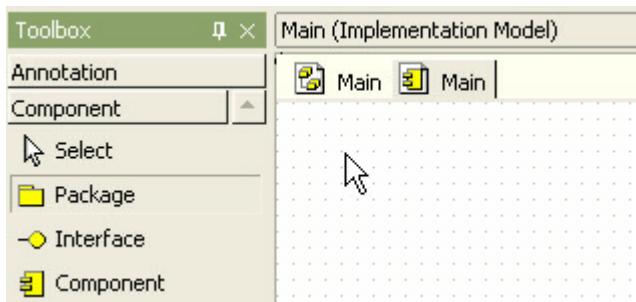
Procedure for creating package

In order to create Package in the component diagram,

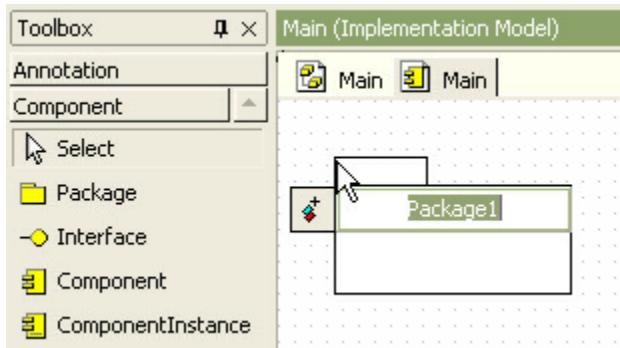
1. Click **[Toolbox] -> [Component] -> [Package]** button.



2. Click at the position where Package will be placed in the **[main window]**.

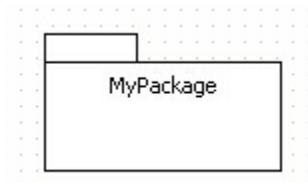


3. A package is created and the quick dialog of package appears.



4. At the quick dialog, enter package name.

5. Press **[Enter]** key. Then the package is shown as follows.

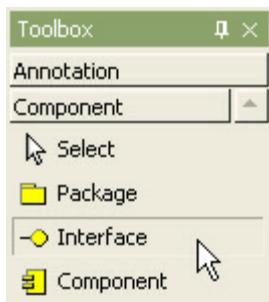


Interface

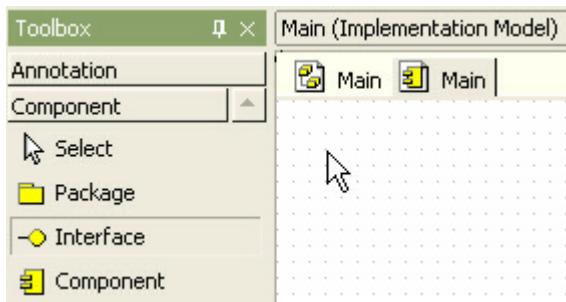
Procedure for creating interface

In order to create Interface,

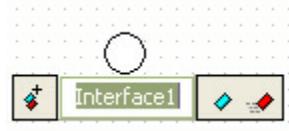
1. Click **[Toolbox] -> [Component] -> [Interface]** button.



2. Click at the position where Interface will be placed in the [main window].



3. At the quick dialog, enter interface name.



4. Press [Enter] key. Then the interface is shown as follows.



Component

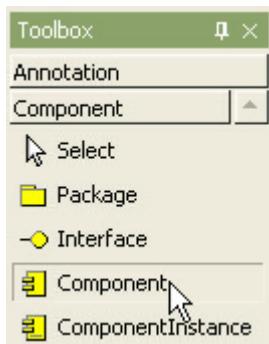
Semantics

A component represents a modular, deployable, and replaceable part of a system that encapsulates implementation and exposes a set of interfaces.

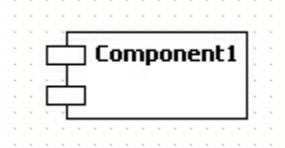
Procedure for creating component

In order to create Component,

1. Click [Toolbox] -> [Component] -> [Component] button.



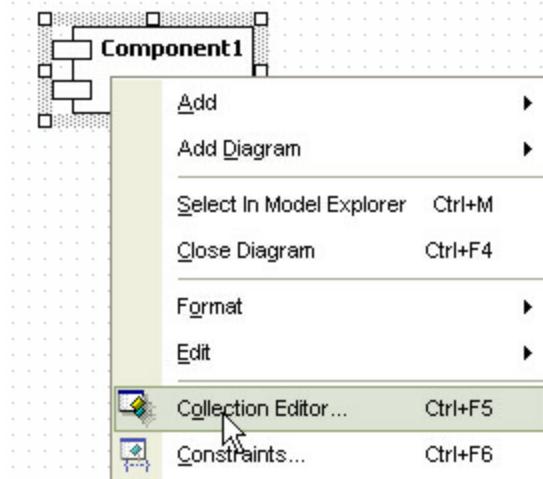
2. Click at the position where Component will be placed in the [**main window**]. And at the quick dialog, enter component name and press [**Enter**] key. The result is as follows.



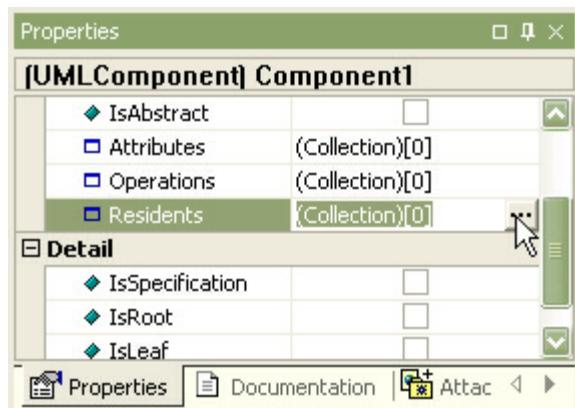
Procedure for adding resident element

In order to add resident element to component,

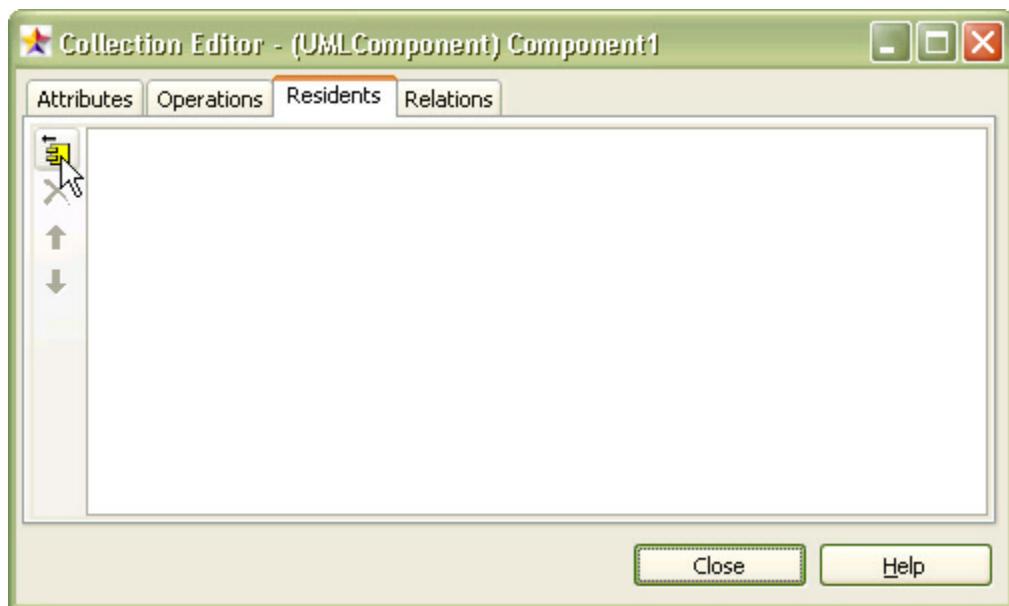
1. Select [**Collection Editor...**] popup menu of component.



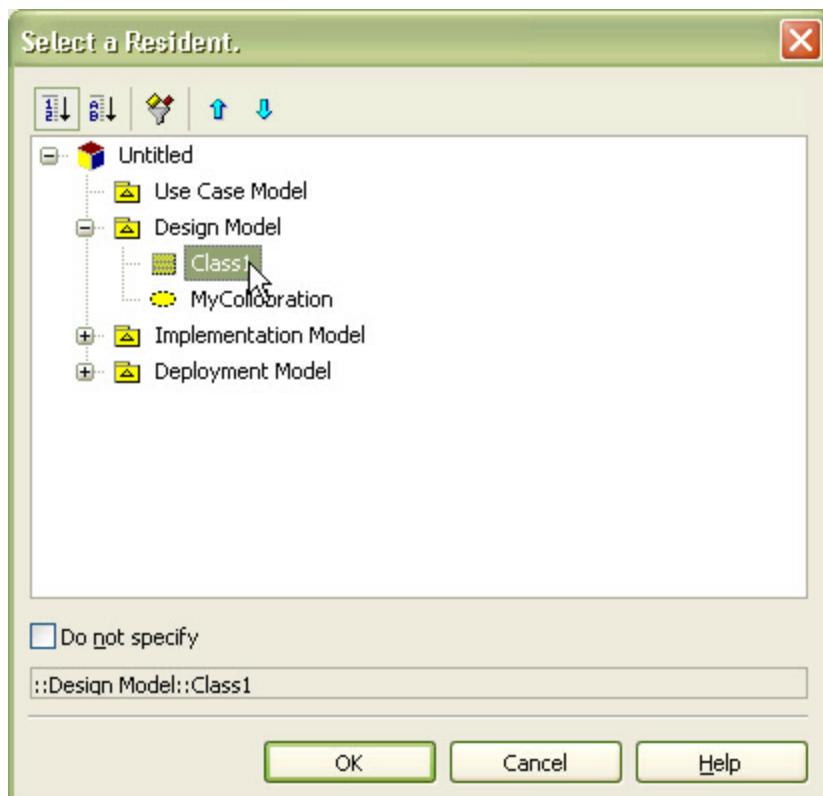
2. Or click [...] button in [**Residents**] property on properties window.



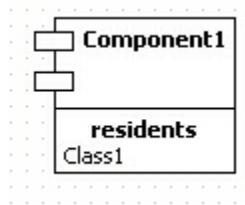
3. At the **[Residents]** tab of the **[collection editor]**, you can add resident element by using button.



4. At the **[Select a Resident]** dialog, select resident component.



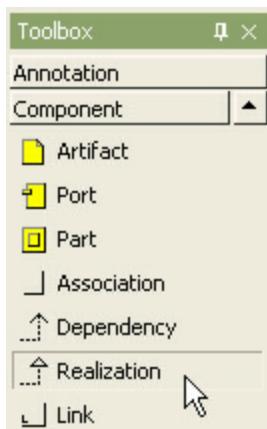
5. The component is assigned to component as resident component and is shown as follows.



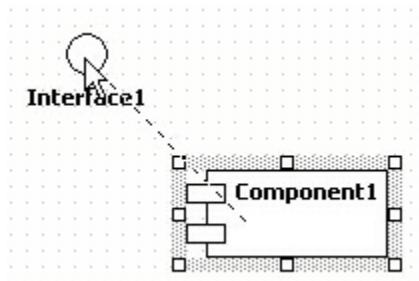
Procedure for creating providing relationship

In order to create providing relationship,

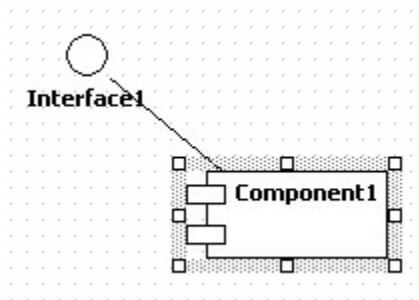
1. Click [Toolbox] -> [Component] -> [Realization] button



2. Drag from component and drop to interface in the [main window].



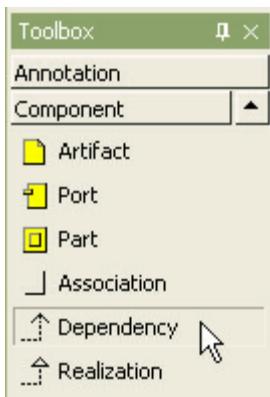
3. The result is as follows.



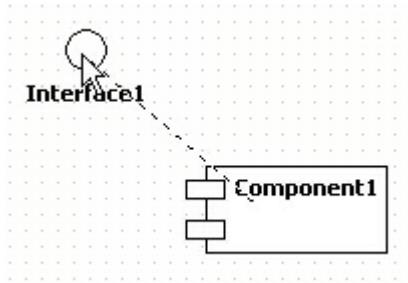
Procedure for creating requiring relationship

In order to create requiring relationship,

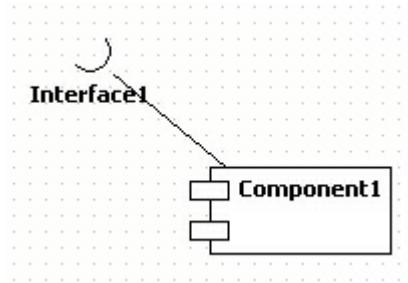
1. Click **[Toolbox]** -> **[Component]** -> **[Dependency]** button.



2.Drag from component and drop to interface in the **[main window]**.



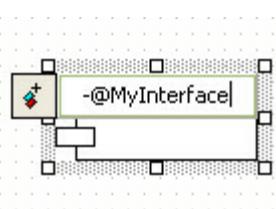
3.Finally, the interface requiring relationship is created.



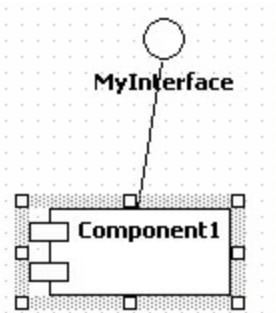
Procedure for creating providing interface of class.

In order to create providing interface of class, use shortcut creation syntax.

- 1.Double-click class. At the quick dialog, enter "-@" staring and interface name, separate interface names by "," character.



2. And press **[Enter]** key. Several interfaces provided by selected class is created and arranged automatically.



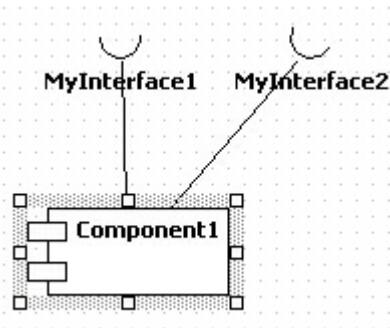
Procedure for creating requiring interface of class.

In order to create requiring interface of class, use shortcut creation syntax.

1. Double-click class. At the quick dialog, enter "-(" or "-->", and enter interface names, separate interface names by "," character.



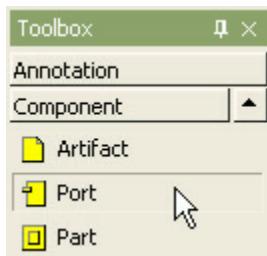
2. And press **[Enter]** key. Several interfaces required by selected class is created and arranged automatically.



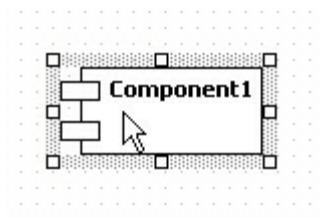
Procedure for creating port

In order to create port on a component,

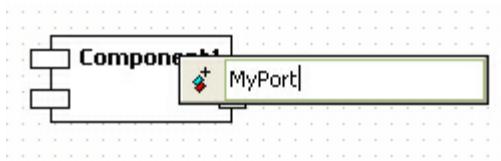
1. Click **[Toolbox] -> [Component] -> [Port]** button.



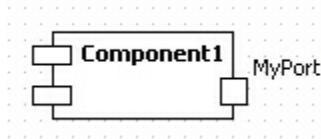
2. And click the component where the port will be contained in the **[main window]**.



3. A port is created on the component. At the quick dialog, enter the port name and press **[Enter]** key to be complete.



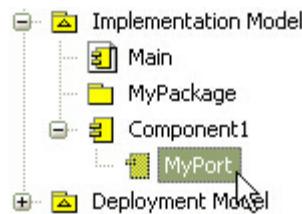
4. The result is as follows.



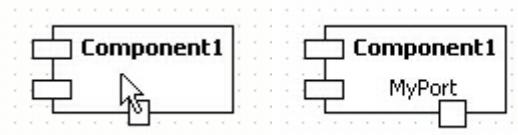
Procedure for creating view by dragging port

You can create port by dragging port from **[model explorer]** to main diagram.

1. Drag port in the **[model explorer]** and drop on the component in the main diagram.



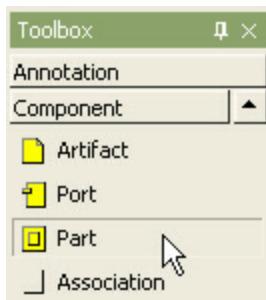
2.A port appears on the component. If it is not dropped on the component but on the other area of the diagram, component with port will be created



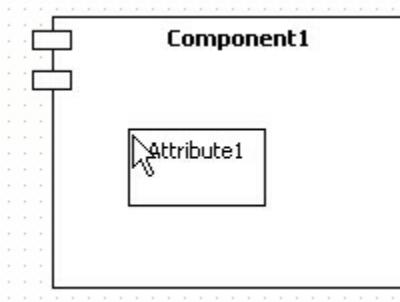
Procedure for creating part

In order to create part,

- 1.Click **[Toolbox] -> [Component] -> [Part]** button.



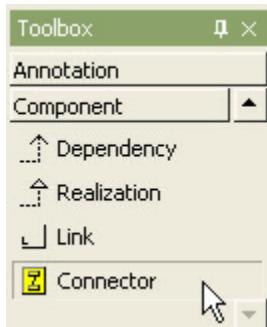
- 2.And click the component where the part will be contained in the **[main window]**.



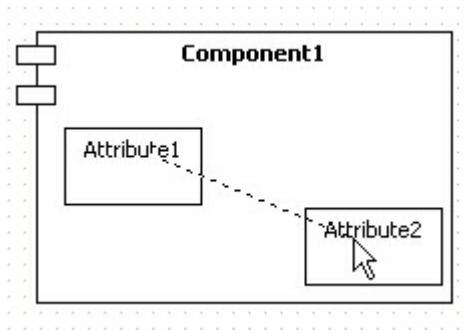
Procedure for creating connector

In order to create connector,

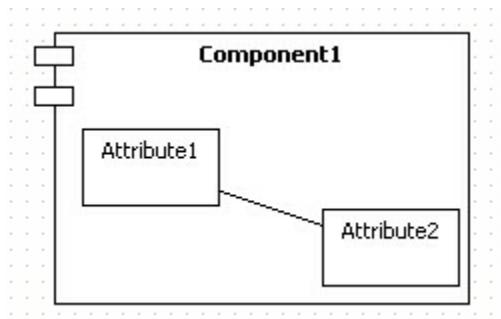
1. Click **[Toolbox] -> [Component] -> [Connector]** button.



2. Drag from one part and drop to the other part in the **[main window]**.



3. The connector between two parts is created finally as follows.



Component Instance

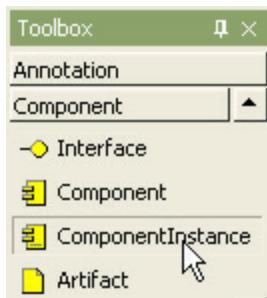
Semantics

A component instance is an instance of a component that resides on a node instance. A component instance may have a state.

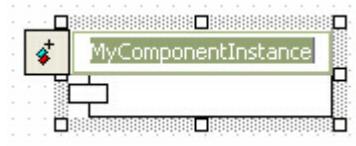
Procedure for creating component instance

In order to create ComponentInstance,

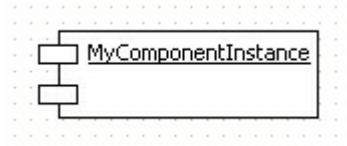
1. Click **[Toolbox] -> [Component] -> [ComponentInstance]** button.



2. And click at the position where ComponentInstance will be placed in the **[main window]**.



3. Enter the component instance name at the quick dialog and press **[Enter]** key. The result is as follows.



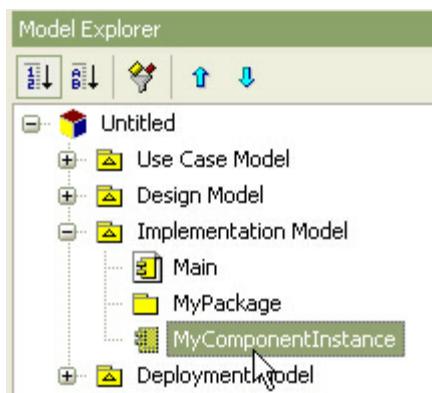
Procedure for adding attribute to component instance

There are two way to add AttributeLink to component instance.

- using ComponentInstance model in the main diagram or the **[model explorer]**
- using **[collection editor]**

In the case of using ComponentInstance model,

1. Select ComponentInstance in the **[main window]** or in the **[model explorer]**.



2. Right-click the selected ComponentInstance, select [Add] -> [Attribute Link] popup menu.

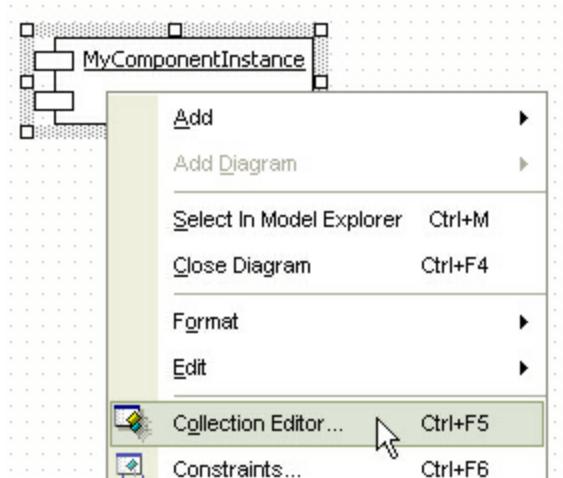


3. and you can add Attribute Link.

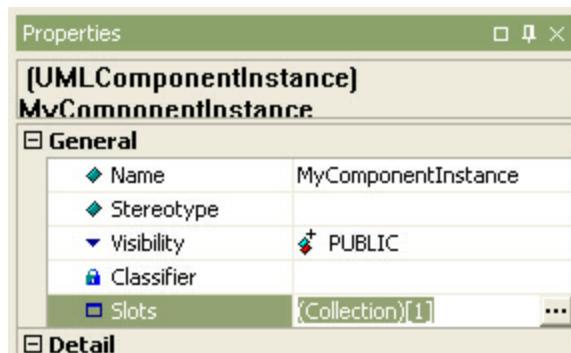


In the other case,

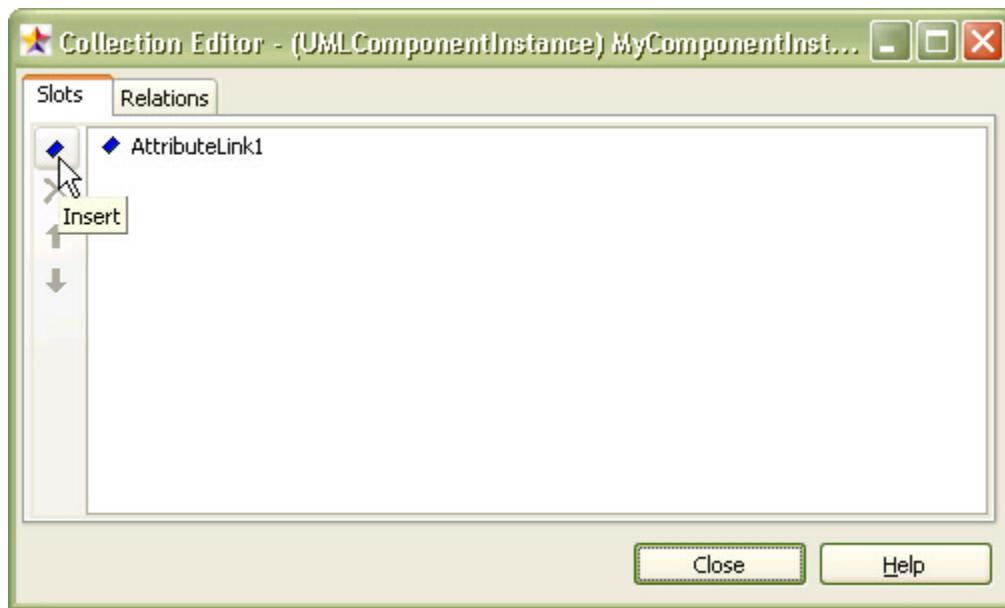
1. Select [Collection Editor...] popup menu of ComponentInstance.



2. Click button in slots property on properties window.



3. At [Slots] tab of the [collection editor], you can add attribute link by using button.



Artifact

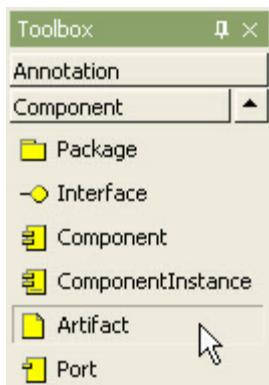
Semantics

An Artifact represents a physical piece of information that is used or produced by a software development process. Examples of Artifacts include models, source files, scripts, and binary executable files. An Artifact may constitute the implementation of a deployable component.

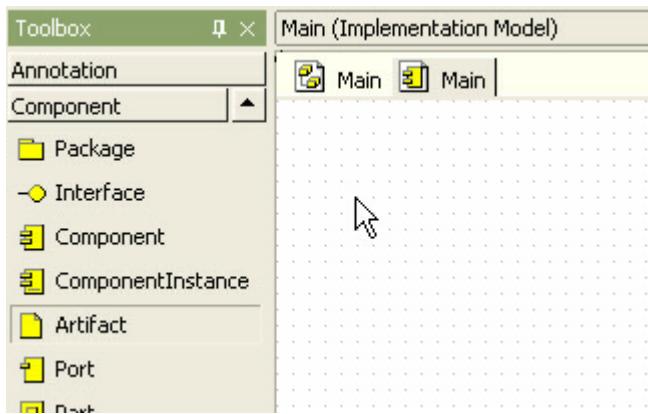
Procedure for creating artifact

In order to create Artifact,

1. Click [Toolbox] -> [Component] -> [Artifact] button.



2. And click at the position where Artifact will be placed in the [main window].



3. The artifact is created on the diagram and the quick dialog is shown. At the quick dialog, enter the artifact name



4. Press [Enter] Key to have done procedure.

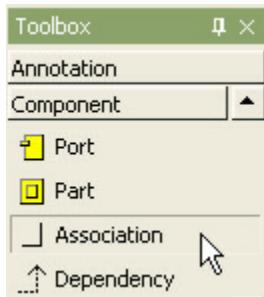


Association

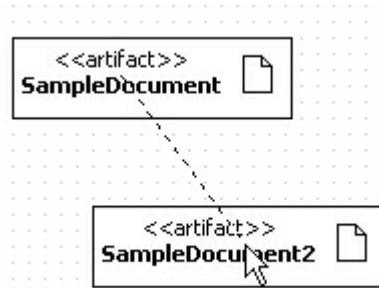
Procedure for creating association

In order to create association,

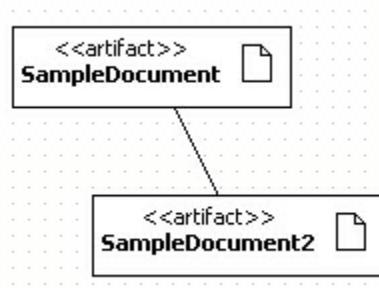
1. Click **[Toolbox] -> [Component] -> [Association]** button.



2. Drag from one associated and drop to another in the **[main window]**.



3. Between two elements, the association is created finally.

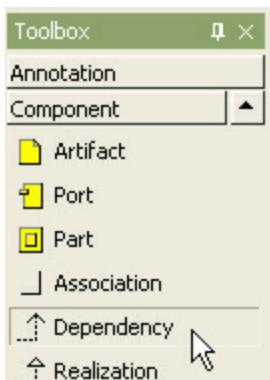


Dependency

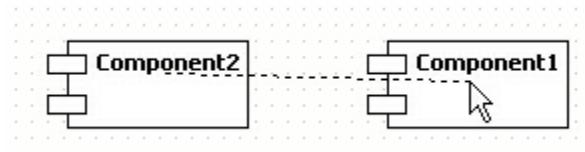
Procedure for creating dependency

In order to create dependency,

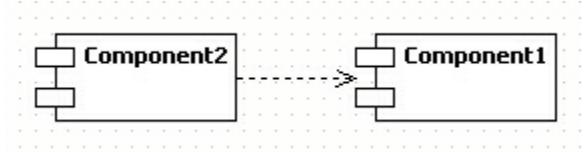
1. Click **[Toolbox] -> [Component] -> [Dependency]** button.



2.Drag and drop between elements in the **[main window]** in depending direction.



3.The dependency between two elements is created.

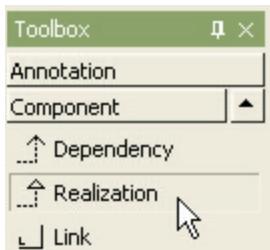


Realization

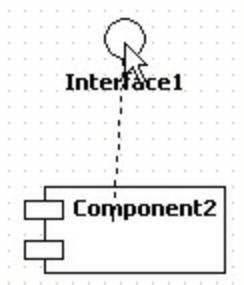
Procedure for creating realization

In order to create realization,

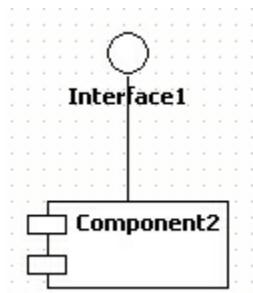
1.Click **[Toolbox] -> [Component] -> [Realization]** button.



2.Drag and drop between elements in the **[main window]** in realization direction.



3. The realization is created as follows.



Link

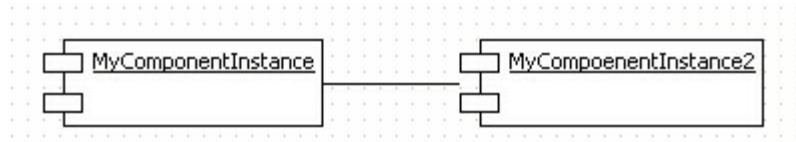
Procedure for creating link

In order to create Link between two components,

1. Click [Toolbox] -> [Component] -> [Link] button.



2. Drag from one ComponentInstance and drop to the other ComponentInstance in the [main window]. Then the link is created as follows.



6.8 Deployment Diagrams

The following elements are available in a deployment diagram.

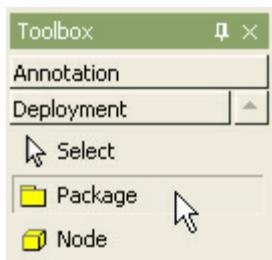
- Package
- Node
- Node Instance
- Artifact
- Port
- Part
- Association
- Directed Association
- Dependency
- Link
- Connector

Package

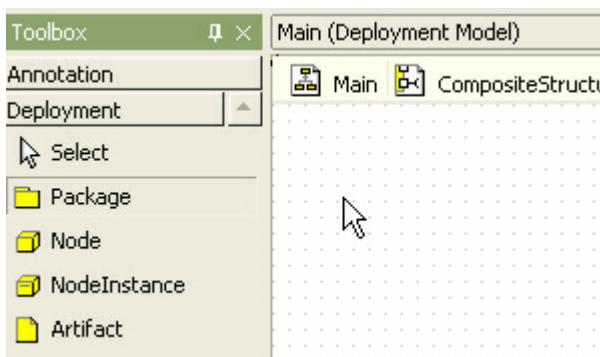
Procedure for creating package

In order to create Package in deployment diagram,

1. Click **[Toolbox] -> [Deployment] -> [Package]** button.



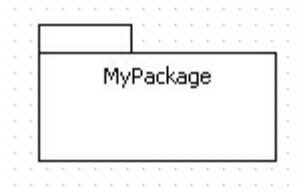
2. Click at the position where package will be placed in the [main window].



3. Then package will be created.



4. At the quick dialog, enter package name and press [**Enter**] key. Then procedure is done.



Node

Semantics:

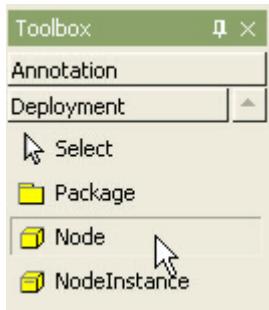
A node is a run-time physical object that represents a computational resource, generally having at least a memory and often processing capability as well, and upon which components may be

deployed.

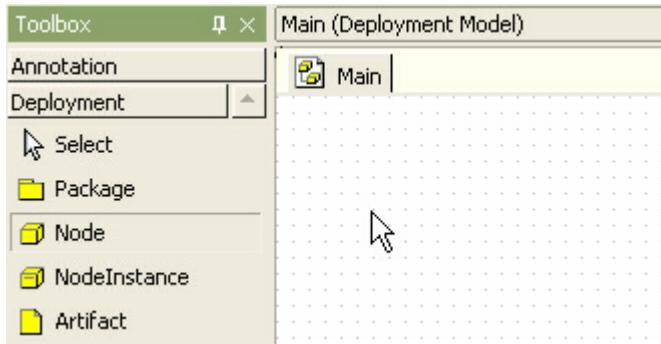
Procedure for creating node

In order to create Node in deployment diagram,

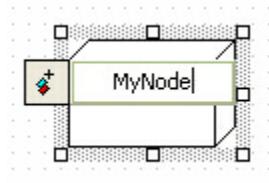
1. Click **[Toolbox] -> [Deployment] -> [Node]** button.



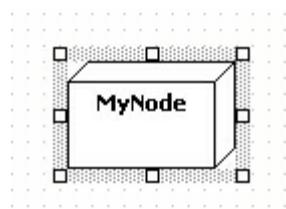
2. Click at the position where Node will be placed in the **[main window]**.



3. Then node is created and the quick dialog appears. Enter the node name at the quick dialog.



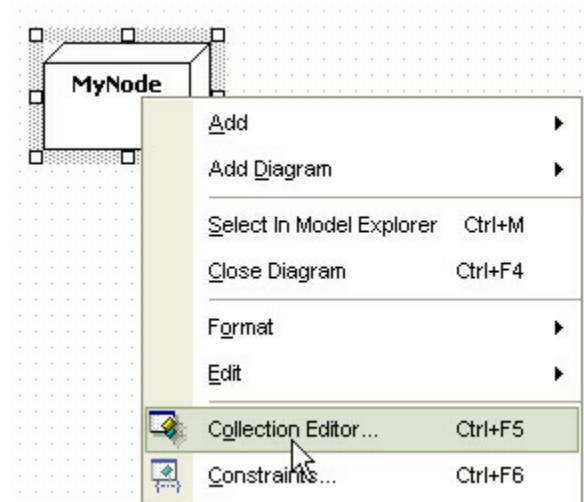
4. And press **[Enter]** key.



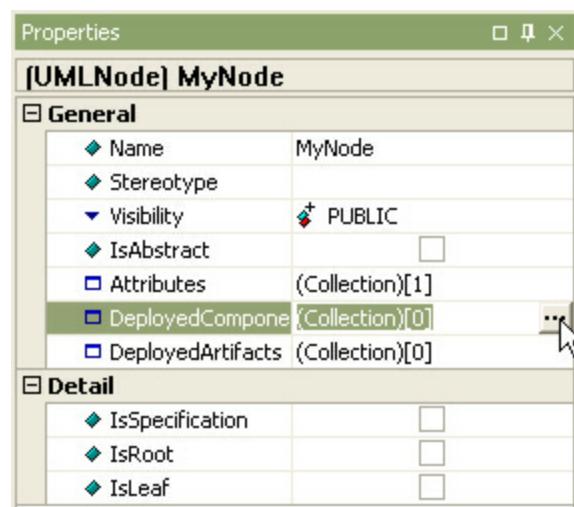
Procedure for adding deployed component

In order to add deployed component to node

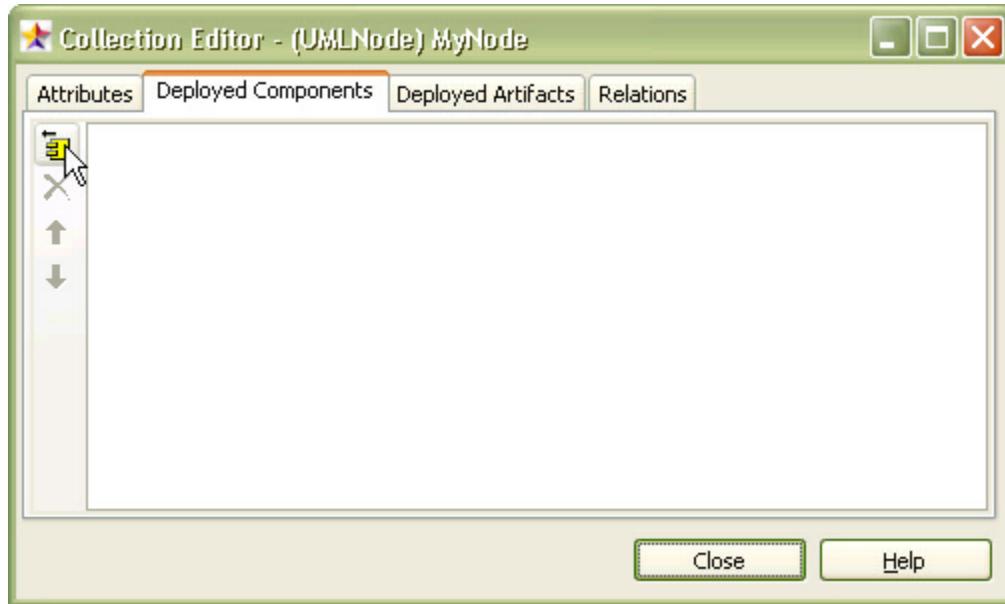
1. Select **[Collection Editor...]** popup menu of node.



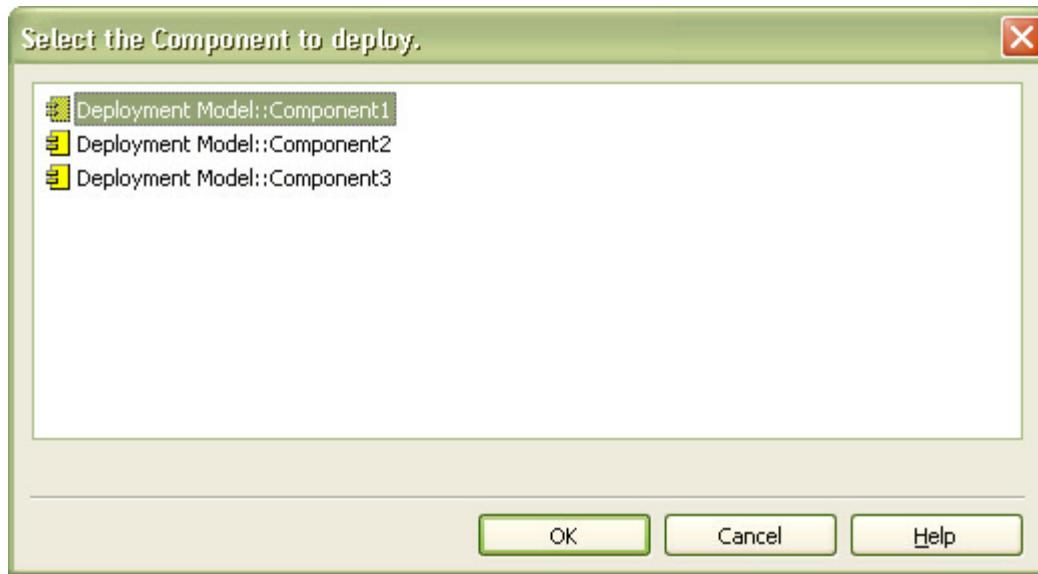
2. Or click button in **[DeployedComponents]** property on properties window.



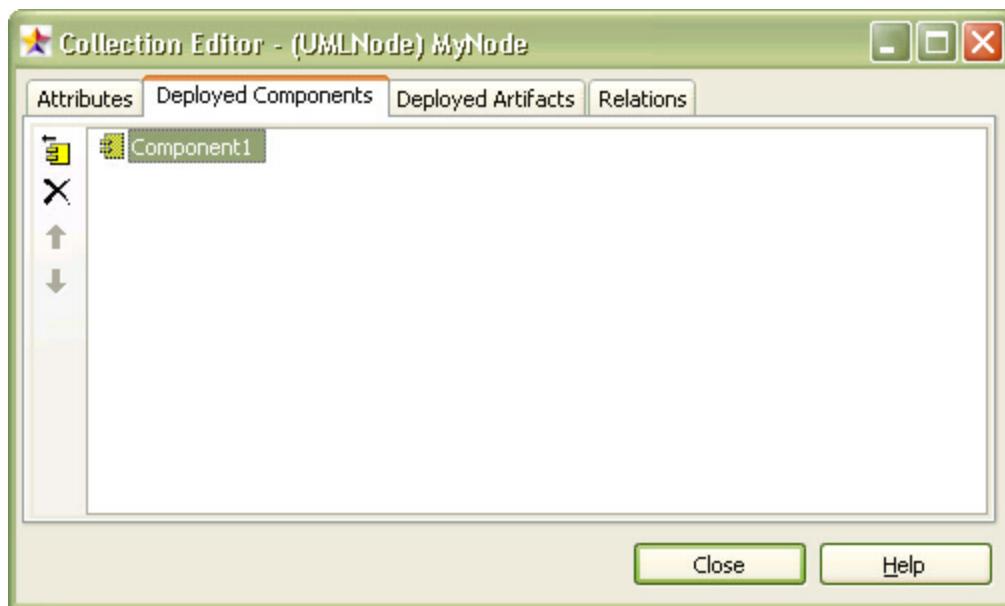
3. At the **[Deployed Components]** tab of the **[collection editor]**, you can add deployed component by using  button.



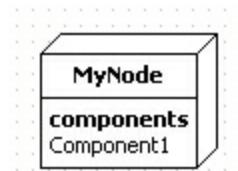
4. At **[Select the Component to deploy]** dialog, select deployed component. To select component, you have already made some component.



5. And click OK button. Then deployed component is added to the node.



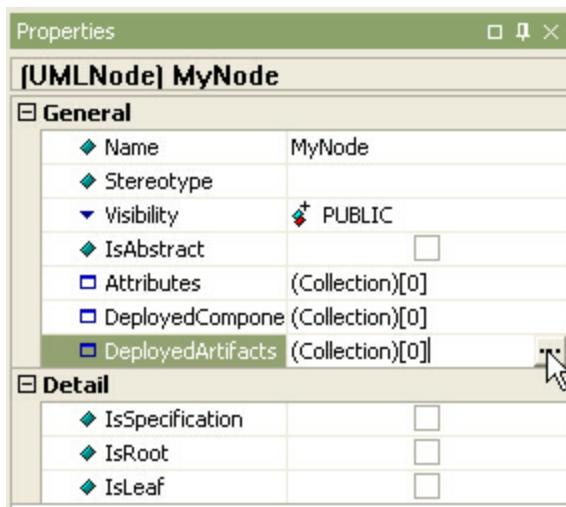
6. The node is shown as following.



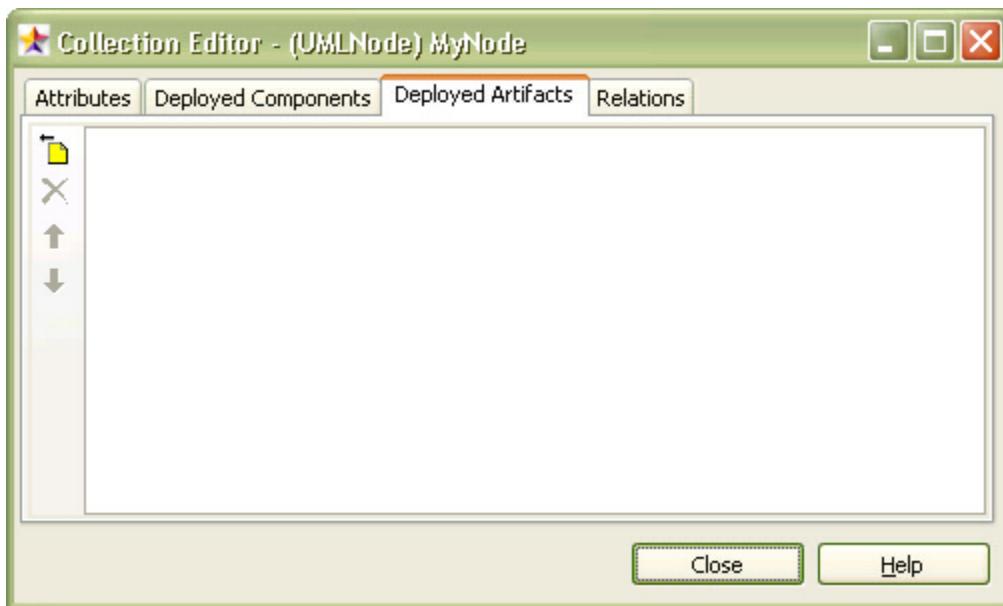
Procedure for adding deployed artifact

In order to add deployed artifact to node,

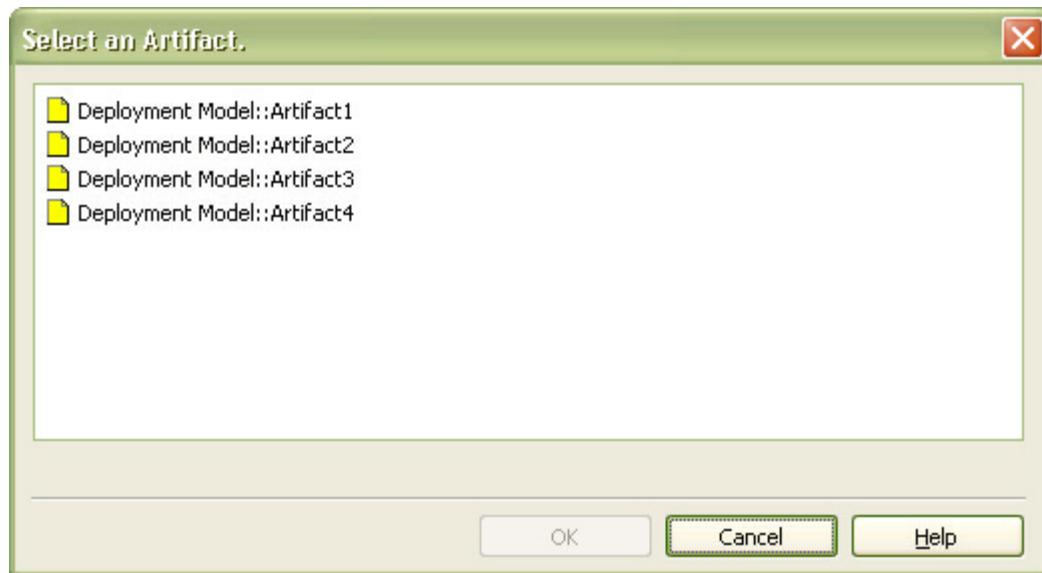
1. Select **[Collection Editor...]** popup menu of node.
2. Or click button in **[DeployedArtifacts]** property on properties window.



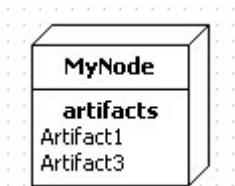
3. At the **[Deployed Artifacts]** tab of the **[collection editor]**, you can add deployed artifact by using button.



4. At the **[Select a Artifact]** dialog, select a deployed artifact and click **[OK]** button.



5. Then the artifact is add to the node and the node is shown as following.

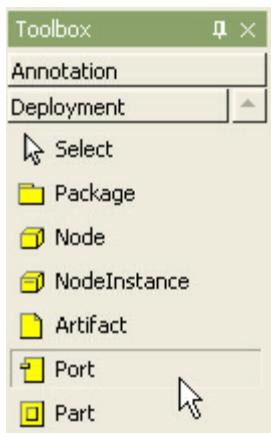


Port

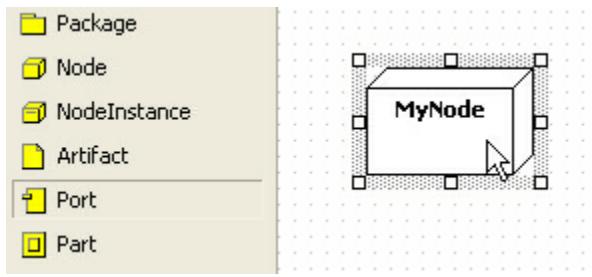
Procedure for creating port

In order to create port on a node,

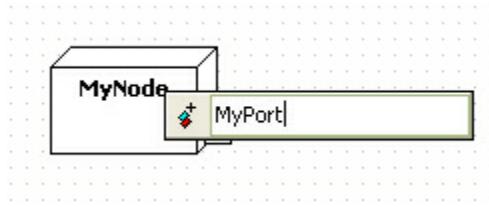
1. Click [Toolbox] -> [Deployment] -> [Port] button.



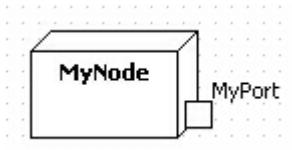
2. Click the node where the port will be contained in the **[main window]**.



3. A port is created on the node and the quick dialog appears. Enter the port name at the quick dialog.



4. And press **[Enter]** key. The result is like the following.

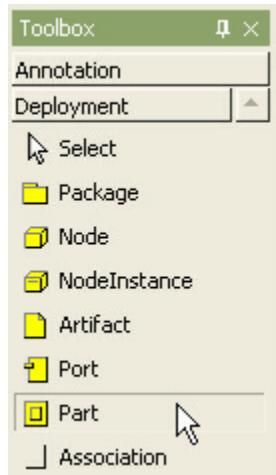


Part

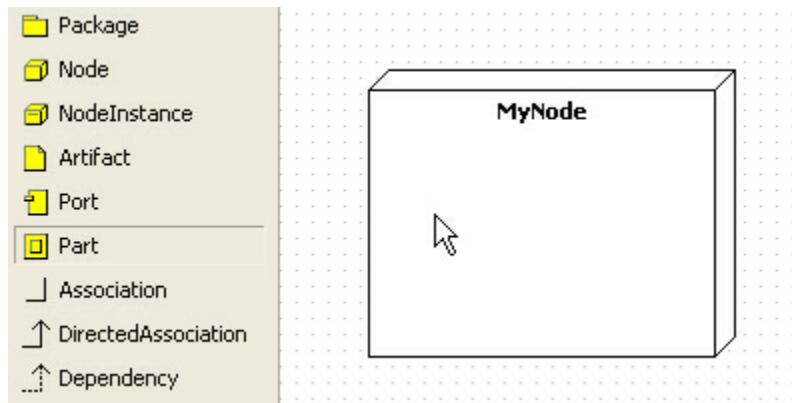
Procedure for creating part

In order to create part on a node

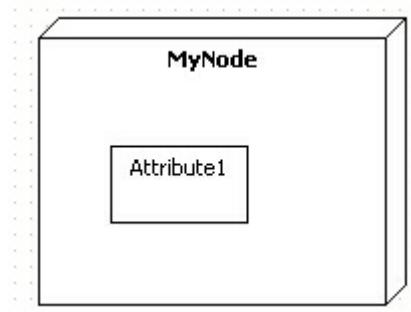
1. Click **[Toolbox] -> [Deployment] -> [Part]** button.



2. Click the node where the part will be contained in the **[main window]**.



3. Finally, a part is created on the node as following.



Connector

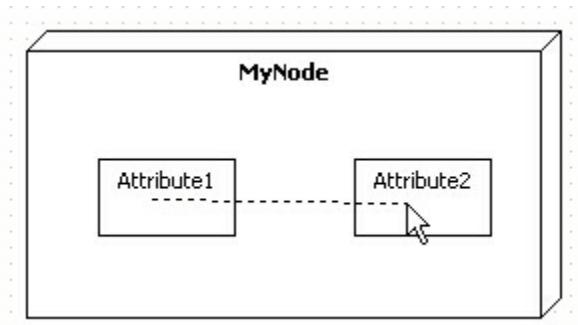
Procedure for creating connector

In order to create connector between two parts,

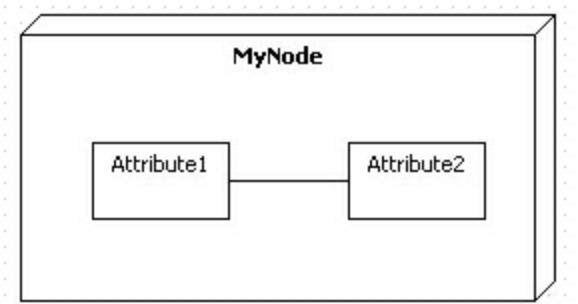
1. Click **[Toolbox] -> [Deployment] -> [Connector]** button.



2. Drag from one part and drop to the other part in the **[main window]**.



3. The result is as follows.



Node Instance

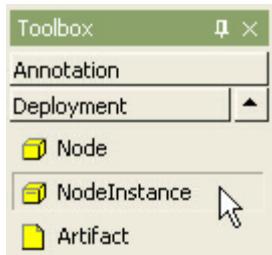
Semantics

A node instance is an instance of a node. A collection of component instances may reside on the node instance.

Procedure for creating node instance

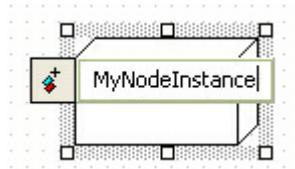
In order to create NodeInstance in deployment diagram,

1. Click [Toolbox] -> [Deployment] -> [NodeInstance] button.

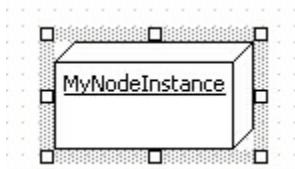


2. Click at the position where NodeInstance will be placed in the [main window], a node is created, and quick dialog appears.

3. Enter the node instance name at the quick dialog and press [Enter] key.



4. The result is as follows.



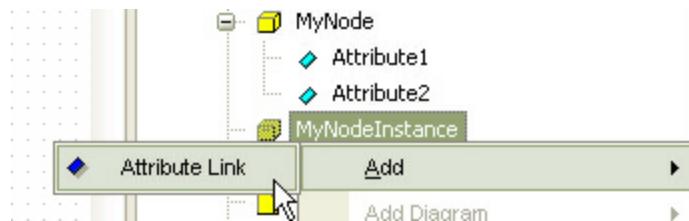
Procedure for adding attribute link to node instance

There are two way to add attribute link to node instance.

- using NodeInstance model in the [main window] or the [model explorer]
- using [collection editor]

In the case of using NodeInstance model

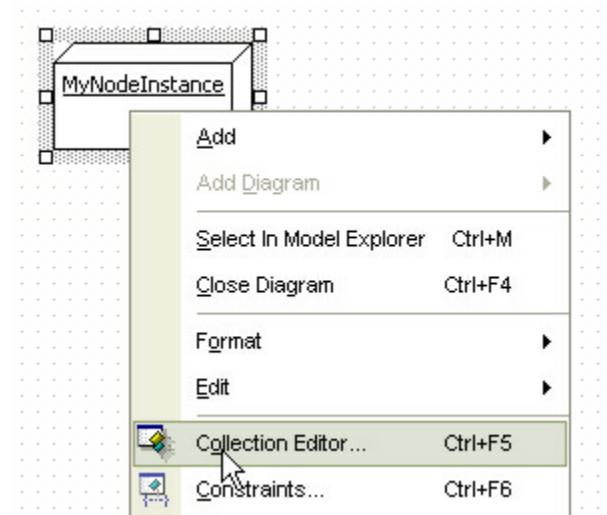
1. Select NodeInstance in the [main window] or in the [model explorer],
2. Right-click the selected NodeInstance, select [Add] -> [Attribute Link] popup menu, and you can add Attribute Link.



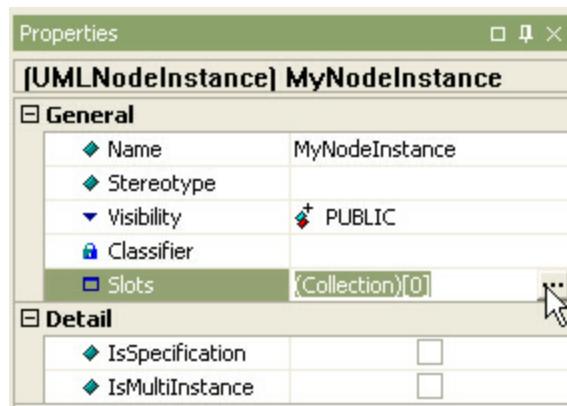
3. The node doesn't show attribute link on the view.

In the other case

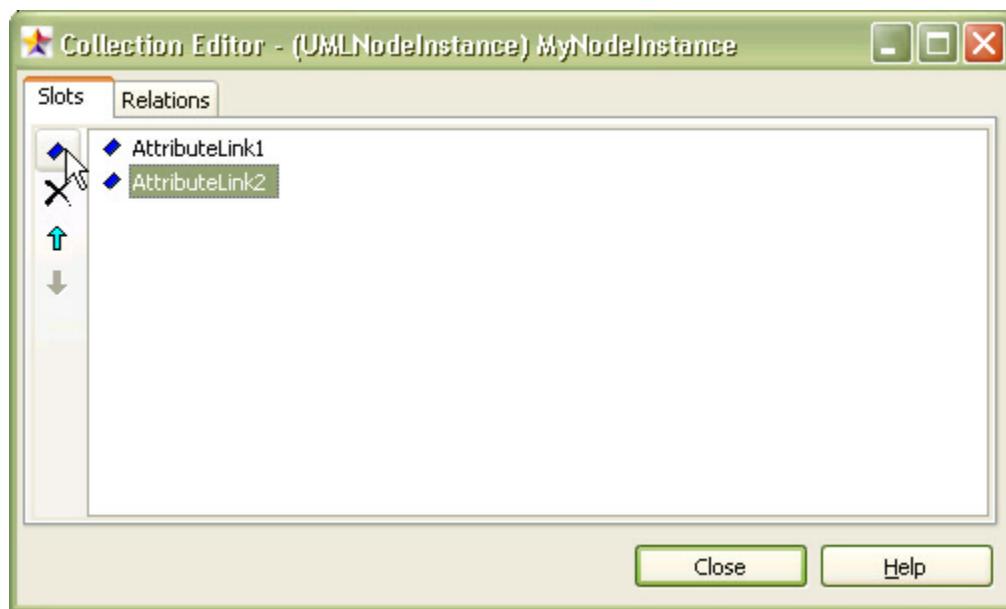
1. Select [Collection Editor...] popup menu of NodeInstance.



2. Or click [...] button in [Slots] property on properties window.



3. At [Slots] tab of the [collection editor], you can add attribute link by using button.

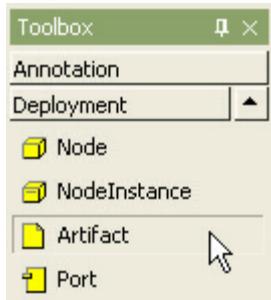


Artifact

Procedure for creating artifact

In order to create Artifact,

1. Click [Toolbox] -> [Deployment] -> [Artifact] button.



2. Click at the position where Artifact will be placed in the [main window].
3. At the quick dialog, enter the artifact name and press [Enter] key.
4. The result is as follows.

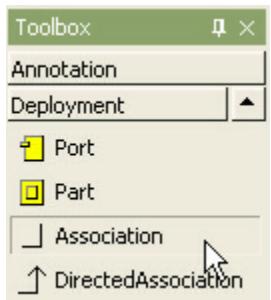


Association

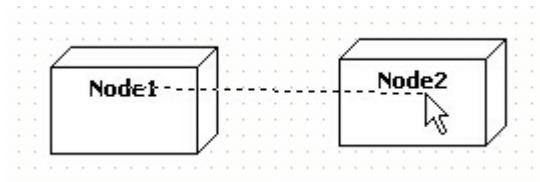
Procedure for creating association

In order to create association,

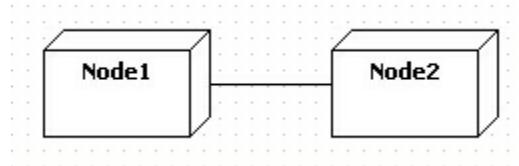
1. Click [Toolbox] -> [Deployment] -> [Association] button.



2. Drag from one associated and drop to another in the [main window].



3. The result is as follows.

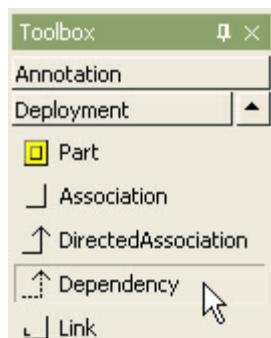


Dependency

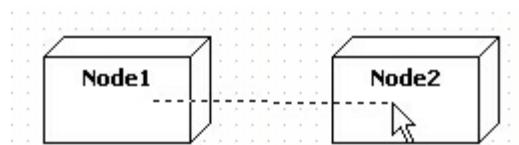
Procedure for creating dependency

In order to create dependency,

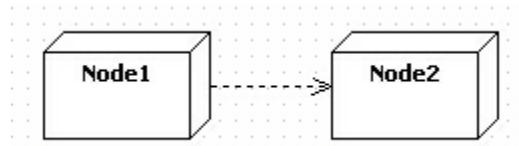
1. Click **[Toolbox] -> [Deployment] -> [Dependency]** button.



2. Drag and drop between elements in the **[main window]** in depending direction.



3. Then dependency between two elements is created as follows.

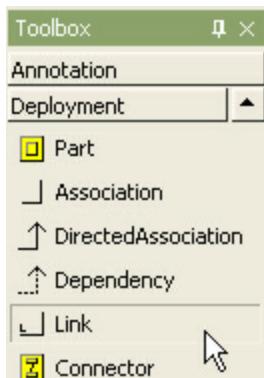


Link

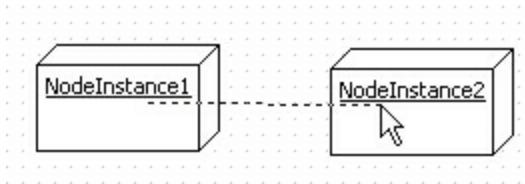
Procedure for creating link

In order to create Link,

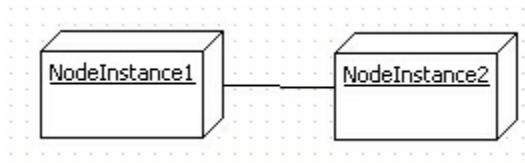
1. Click **[Toolbox] -> [Deployment] -> [Link]** button.



2. Drag from one NodeInstance and drop to the other NodeInstance in the **[main window]**.



3. Then the link between two node instances is created.



6.9 Structure Diagrams

The following elements are available in a composite structure diagram.

- Class
- Interface
- Port
- Part

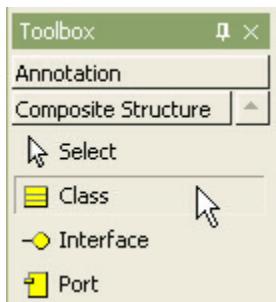
- Dependency
- Connector

Class

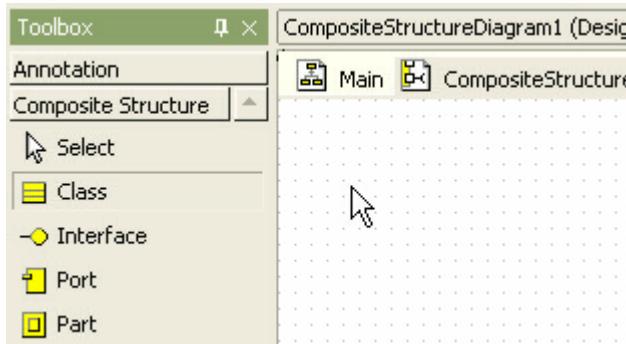
Procedure for creating class

In order to create Class in composite structure diagram,

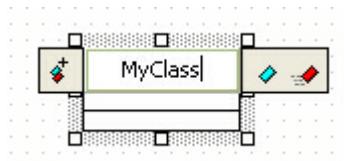
1. Click **[Toolbox] -> [Composite Structure] -> [Class]** button



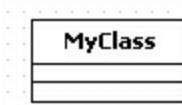
2. Click at the position where Class will be placed in the **[main window]**.



3. At the quick dialog, enter the class name.



4. Press **[Enter]** key. Then a class is created finally.

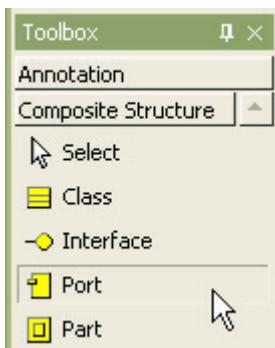


Port

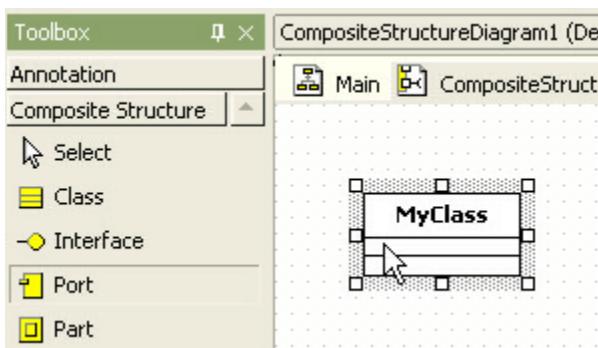
Procedure for creating port

In order to create port in composite structure diagram,

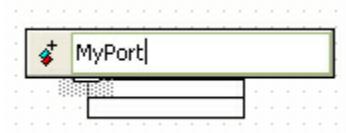
1. Click **[Toolbox] -> [Composite Structure] -> [Port]** button.



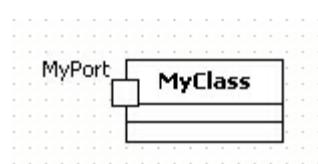
2. And click the class where the port will be contained in the **[main window]**.



3. At the quick dialog, enter the port name.



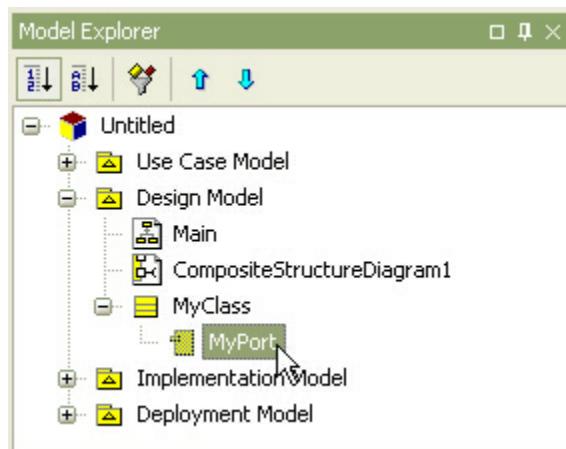
4. Press **[Enter]** key. Then a port is created.



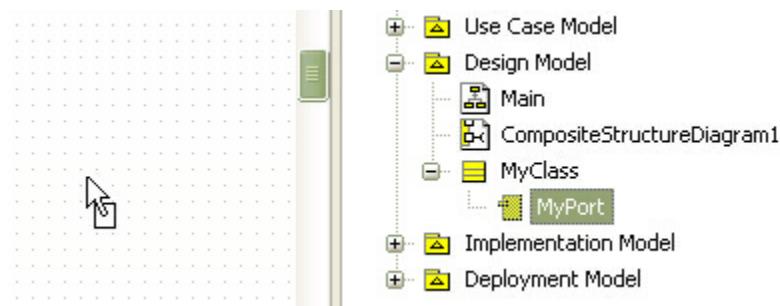
Procedure for creating view by draging port

You can create port by draging port from **[model explorer]** to main diagram.

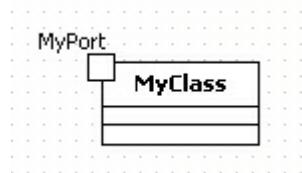
- 1.Click port in the **[model explorer]**.



- 2.Drag it and drop on the class in the composite structure diagram.



- 3.If it is not dropped on the component but on the other area of the diagram, component with port will be created.

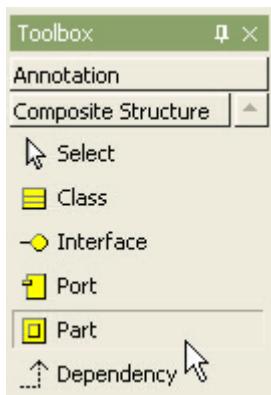


Part

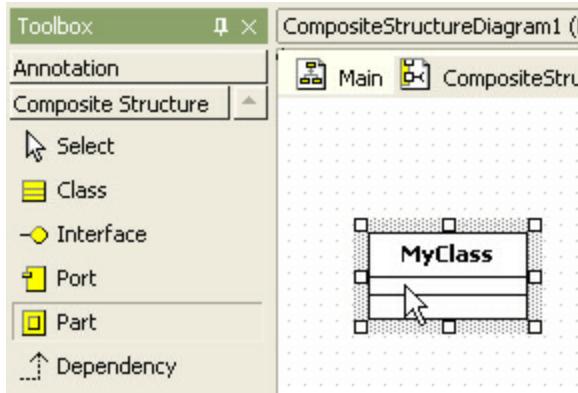
Procedure for creating part

In order to create part in composite structure diagram

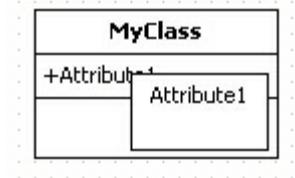
1. Click **[Toolbox] -> [Composite Structure] -> [Part]** button



2. Click a class where the part will be contained in the **[main window]**.



3. Then a part is created in the class.

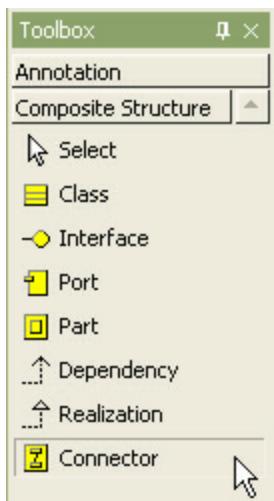


Connector

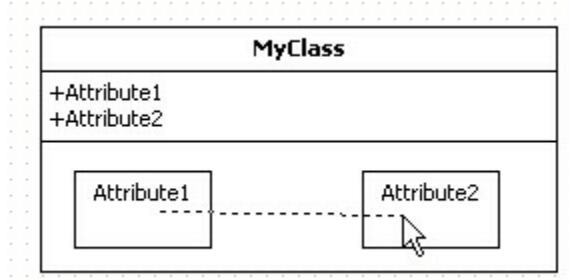
Procedure for creating connector

In order to create connector in composite structure diagram,

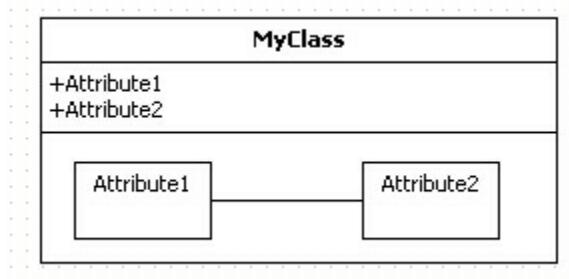
1. Click **[Toolbox] -> [Composite Structure] -> [Connector]** button.



2. Drag from one part and drop to the other part in the **[main window]**.



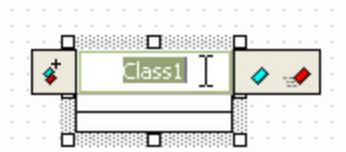
3. Then connector between two parts is created finally.



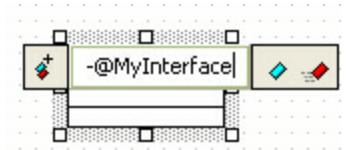
Procedure for creating providing interface of class.

In order to create providing interface of class in composite structure diagram, use shortcut creation syntax.

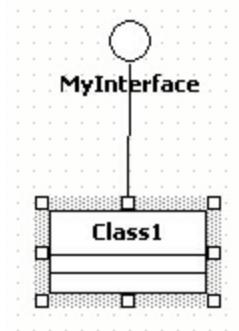
1. Double-click class and quick dialog appears.



2. At the quick dialog, enter "-@" starting and interface name, separate interface names by "," character.



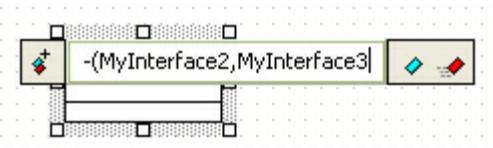
3. And press [**Enter**] key. Several interfaces provided by selected class is created and arranged automatically.

**Procedure for creating requiring interface of class.**

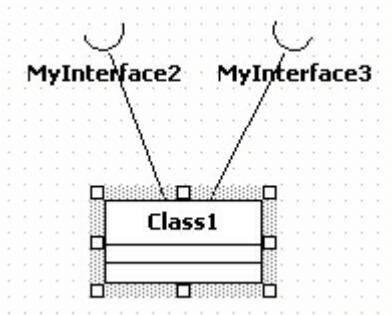
In order to create requiring interface of class, use shortcut creation syntax.

1. Double-click class.

2. At the quick dialog, enter "-(" or "-->", and enter interface names, separate interface names by "," character.



3. And press **[Enter]** key. Several interfaces required by selected class is created and arranged automatically.

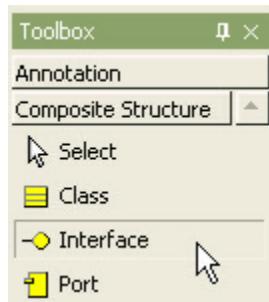


Interface

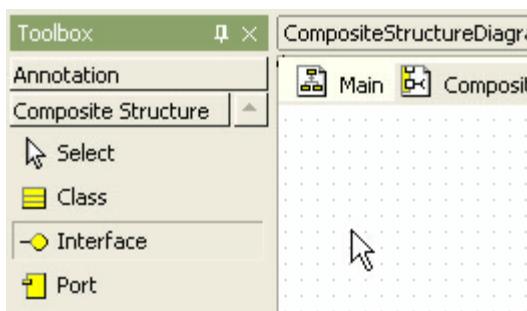
Procedure for creating interface

In order to create Interface in composite strucutre diagram,

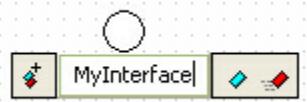
1. Click **[Toolbox] -> [Composite Structure] -> [Interface]** button.



2. Click at the position where Interface will be placed in the **[main window]**.



3. At the quick dialog, enter the interface name.



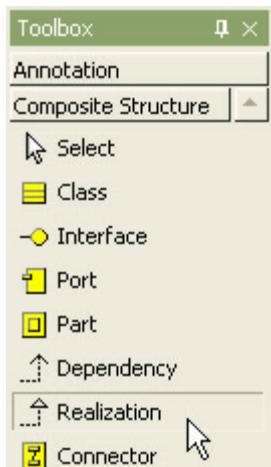
4. And press [Enter] key. Then interface creation procedure is done.



Procedure for creating providing relationship

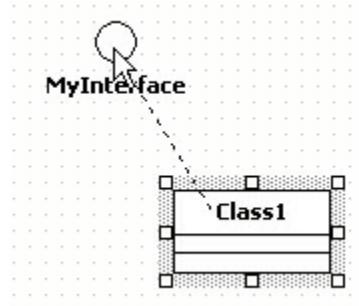
In order to create providing relationship in composite structure diagram,

1. Click **[Toolbox] -> [Composite Structure] -> [Realization]** button.

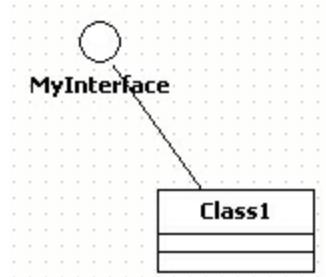


2. Drag from element(Class, Port, Part, Package, Subsystem) and drop to interface in the

[main window].



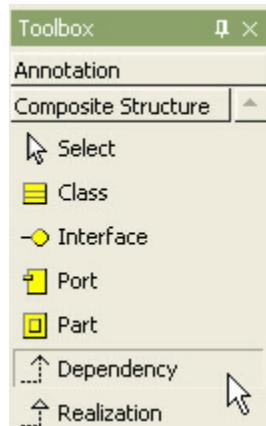
3. Then connection between two elements is created finally.



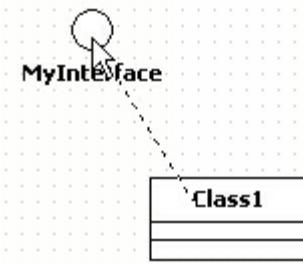
Procedure for creating requiring relationship

In order to create requiring relationship in composite dialog,

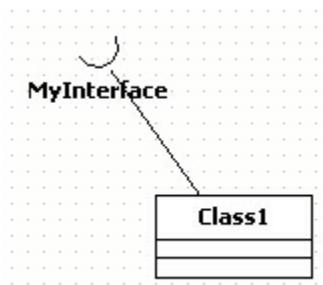
1. Click [Toolbox] -> [Composite Structure] -> [Dependency] button.



2. Drag from element(Class, Port, Part, Package, Subsystem) and drop to interface in the [main window].



3. Then interface requiring relationship is created finally as following.

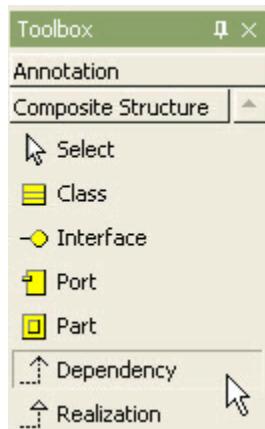


Dependency

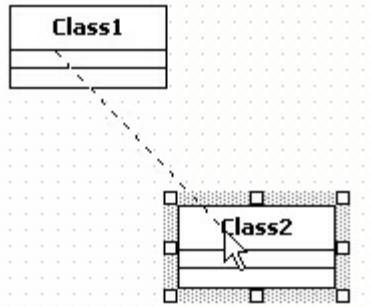
Procedure for creating dependency

In order to create dependency in composite structure diagram,

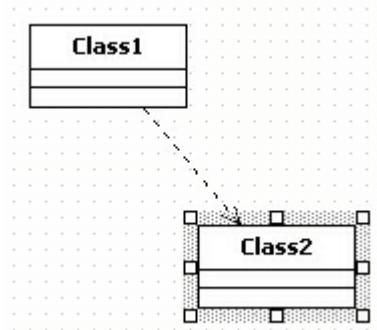
1. Click **[Toolbox] -> [Composite Structure] -> [Dependency]** button.



2. Drag and drop between elements in the **[main window]** in depending direction.



3. Then dependency is created as following.

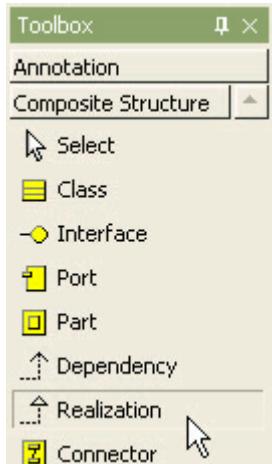


Realization

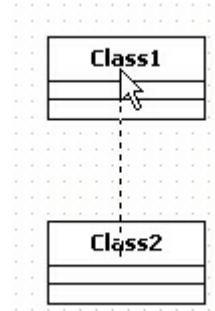
Procedure for creating realization

In order to create realization in composite structure diagram,

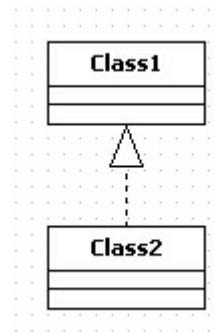
1. Click **[Toolbox] -> [Composite Structure] -> [Realization]** button



2. Drag and drop between elements in the **[main window]** in realization direction.



3. Then realization between two elements is created as following.



Collaboration

Semantics

Behavior is implemented by ensembles of Instances that exchange Stimuli within an overall interaction to accomplish a task. To understand the mechanisms used in a design, it is important to see only those Instances and their cooperation involved in accomplishing a purpose or a related set of purposes, projected from the larger system of which they are part of. Such a static construct is called a Collaboration.

Procedure for creating collaboration

In order to create collaboration in composite structure diagram,

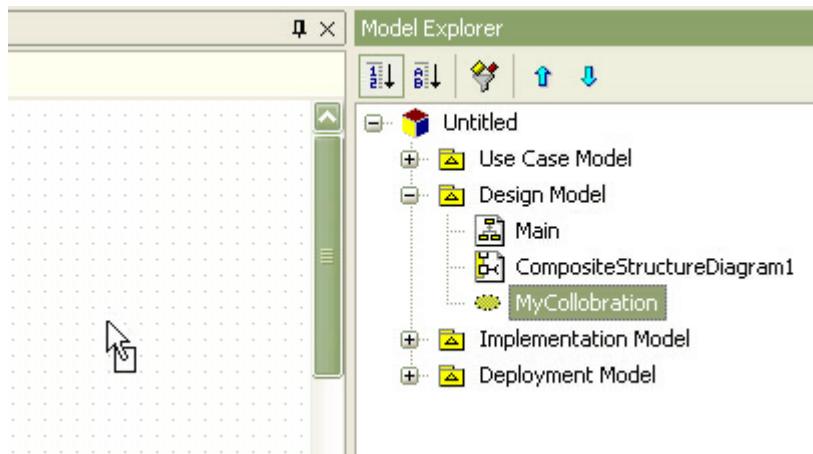
1. select package in the **[model explorer]**, right-click, and select **[Add] -> [Collaboration]** popup menu.



2. Then collaboration is created under the package in the **[model explorer]**. Enter the collaboration name.



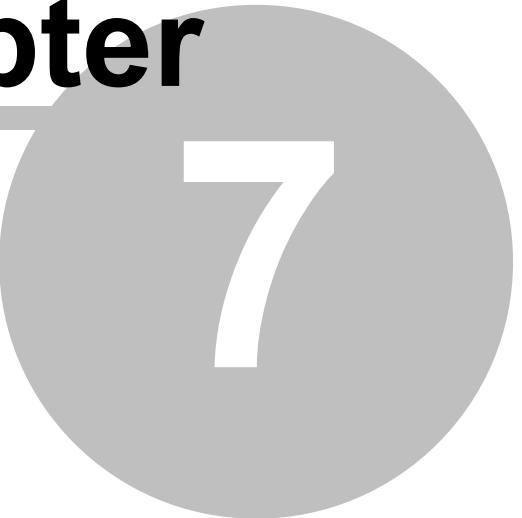
3. And drag the collaboration and drop on the **[main window]**.



4. Then the collaboration is placed on the diagram.



Chapter



7

7 Program Configuration

This chapter describes in detail the procedures for configuring WhiteStarUml environments and the available configuration option items.

- General Configuration
- Diagram Configuration
- General View Configuration
- Specific View Configuration

7.1 General Configuration

General Configuration is a group of the basic and general option items for the program. This category includes the **[General]**, **[Browser]** and **[Collection Editor]** subcategories.

[General] Options

Option Item	Default	Description
Max. number of undo actions	30	Specifies the maximum number of actions for undo and redo. The range for numbers of maximum undo is 1~100.
Recent project files	10	Specifies the maximum number of project files to be kept under the recent project menu item. The range for recent project files is 1~20.
Create backup files	True	Specifies whether to create backup files when saving changes.
Open the New Project dialog box at startup	True	Specifies whether to open the new Project dialog box at startup.
URL of Help Document	See description	Specifies the address of online help of WhiteStarUml. The user don't need to specify this by himself and it is modified by the release install program of product such as patch and update. The default address of online help is http://staruml.tigris.org/documentation/doc.html .

[Browser] Options

Option Item	Default	Description
Show stereotypes	True	Specifies whether to show the stereotype name for each element in the model explorer.

[Collection Editor] Options

Option Item	Default	Description
Show stereotypes	True	Specifies whether to show the stereotype name for each element in the collection editor.
Show visibility with icons	True	Specifies whether to show visibility for each element in the collection editor.
Show names only	False	Specifies whether to show the full expression or the name only for each element item in the collection editor (e.g. name or the full signature for an operation).

7.2 Diagram Configuration

Diagram Configuration is a group of the general option items related to diagrams. This category includes the [Diagram Size], [Grid] and [Interaction Diagram] subcategories.

[Diagram Size] Options

Option Item	Default	Description
Default diagram width	5000	Specifies the maximum diagram width. Adjust this value if the diagram area is not large enough. The range for default diagram width is 100~50000.
Default diagram height	5000	Specifies the maximum diagram height. Adjust this value if the diagram area is not large enough. The range for default

	diagram height is 1~5000.
--	---------------------------

[Grid] Options

Option Item	Default	Description
Grid width	4	Specifies the width of the grid used for editing diagram. The range for grid width is 1~20.
Grid height	4	Specifies the height of the grid used for editing diagrams. The range for grid height is 1~20.
Show grid	True	Specifies whether to show the grid in diagrams.

[Interaction Diagram] Options

Option Item	Default	Description
Message signature	Hide	Specifies how the messages/stimuli will be indicated in sequence or collaboration diagrams (hide, show type only, show name only, and show name and type).
Show sequence number	True	Specifies whether the message/stimulus sequence number is shown in sequence or collaboration diagrams.
Show Activation	True	Specifies whether to show activation by message/stimulus in sequence diagrams.

7.3 General View Configuration

General View Configuration is a group of the basic and general option items related to view elements. This category includes the **[Default View Style]** and **[Default View Format]** subcategories.

[Default View Style] Options

Option Item	Default	Description
Default fill color	\$00B9FFFF	Specifies the default fill color for view elements (default is light)

		yellow).
Default line color	\$00000080	Specifies the default line color for view elements (default is maroon).
Default font name	Tahoma	Specifies the default font face for view elements.
Default font size	8	Specifies the default font size for view elements. The range for default font size is 1~50.
Default font color	\$00000000	Specifies the default font color for view elements (default is black).

[Default View Format] Options

Option Item	Default	Description
Line style	Rectilinear	Specifies the Line Style for connection elements (either rectilinear or oblique).
Show stereotype	text	Specifies the default stereotype indication method (text, icon, or hide).
Show parent name	False	Specifies whether to show the name of the parent element that contains the model element represented by the view element.
Automatic resize	False	Specifies whether to automatically resize view elements.
Show compartment visibility	True	Specifies whether to show compartment visibility for view elements (e.g., attribute compartment, operation compartment, etc.).
Show compartment stereotype	True	Specifies whether to show compartment stereotype for view elements (e.g., attribute compartment, operation compartment, etc.).
Show operation signature	True	Specifies whether to show signature when expressing operation elements.
Show property	False	Specifies whether to show the property items (e.g. tagged values, changeability attribute, etc.) included in view elements.
Suppress attribute	False	Specifies whether to suppress the attributes for class type view elements.

Suppress operation	False	Specifies whether to suppress the operations for class type view elements.
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7.4 Specific View Configuration

Specific View Configuration is a group of the option items related to specific views. This category includes the **[UseCase View]**, **[Actor View]**, **[Enumeration View]**, **[Interface View]**, **[Artifact View]**, **[Component View / Component Instance View]** and **[Node View / Node Instance View]** subcategories.

[UseCase View] Option

Option Item	Default	Description
Show stereotype	Text	Specifies the default stereotype indication method for UseCase view elements (Text, Icon, None, Decoration or hide).
Suppress attribute	True	Specifies whether to suppress the attributes for UseCase view elements.
Suppress operation	True	Specifies whether to suppress the operations for UseCase view elements.

[Actor View] Options

Option Item	Default	Description
Show stereotype	Text	Specifies the default stereotype indication method for Actor view elements (Text, Icon, None, Decoration or hide).
Suppress attribute	True	Specifies whether to suppress the attributes for Actor view elements.
Suppress operation	True	Specifies whether to suppress the operations for Actor view elements.

[Enumeration View] Options

Option Item	Default	Description
-------------	---------	-------------

Suppress literal	False	Specifies whether to suppress the literals for enumeration view elements.
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[Interface View] Options

Option Item	Default	Description
Show stereotype	Icon	Specifies the default stereotype indication method for interface view elements (Text, Icon, None, Decoration or hide).
Suppress attribute	True	Specifies whether to suppress the attributes for interface view elements.
Suppress operation	True	Specifies whether to suppress the operations for interface view elements.

[Artifact View] Options

Option Item	Default	Description
Show stereotype	Decoration	Specifies the default stereotype indication method for artifact view elements (Text, Icon, None, Decoration or hide).
Suppress attribute	True	Specifies whether to suppress the attributes for interface view elements.
Suppress operation	True	Specifies whether to suppress the operations for interface view elements.

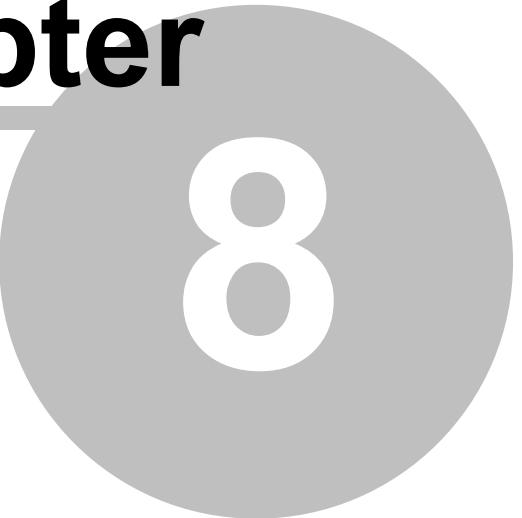
[Component View / ComponentInstance View] Options

Option Item	Default	Description
Show stereotype	Text	Specifies the default stereotype indication method for component and ComponentInstance view elements (Text, Icon, None, Decoration or hide)

[Node View / NodeInstance View] Options

Option Item	Default	Description
Show stereotype	Text	Specifies the default stereotype indication method for node and NodeInstance view elements (Text, Icon, None, Decoration or hide)

Chapter



8

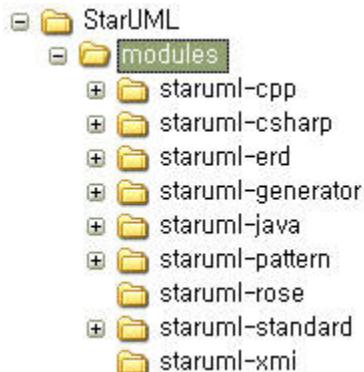
8 Managing Modules

This chapter contains how to manage modules. Included are installing module, component of module and remove of module.

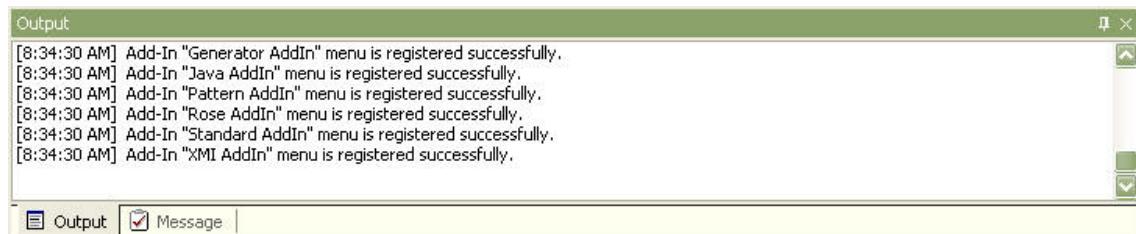
8.1 Installing Modules

The method to install the module in WhiteStarUml is very simple. The user copy a module directory which wants the install at the WhiteStarUml Module directory beneath. WhiteStarUml is running.

1. Download the module to install from the WhiteStarUml site.
2. Copies downloaded module file under {Installed path of WhiteStarUml}\modules directory. If it is zip file, unzip it in a folder as creating a folder as zip file name. If installed path of WhiteStarUml is "C:\Program Files\WhiteStarUml", copies the folder under C:\Program Files\WhiteStarUml\modules.



3. When WhiteStarUml is running, stop the running and rerun it.
4. Log about Module install at Output window is marked if Module was installed accurately.



Logs of module

The Log as Loading of Module show the Output window as follows. For detailed descriptions of module, see Module, Approach, Framework and Profile.

Component	State	Log
Profiles (.prf)	Successed reading profile file.	The Profile "..." is loaded successfully.
	Failed to load the profile file.	Failed to load the Profile "...".
Approaches(.apr)	Successed reading approach file.	The Approach "..." is loaded successfully.
	Failed to load the approach file.	Failed to load the Approach "...".
Framework(.frw)	Successed reading framework file.	The Framework "..." is loaded successfully.
	Failed to load the framework file.	Failed to load the Framework "...".
AddIn (.aid)	Registered in AddIn successfully.	AddIn "... AddIn" is registered successfully.
	Registered other DLLs in AddIn successfully.	AddIn sub module "....dll" is registered successfully.
	Successed reading add-in file.	Add-In "..." is loaded successfully.
	Failed to load error in the add-in file.	Failed to load the Add-In "...".
Menu(.mnu)	Successed reading menu file.	Add-In "... AddIn" menu is registered successfully.
	Failed to load error in the menu file.	Failed to load the menu "...".

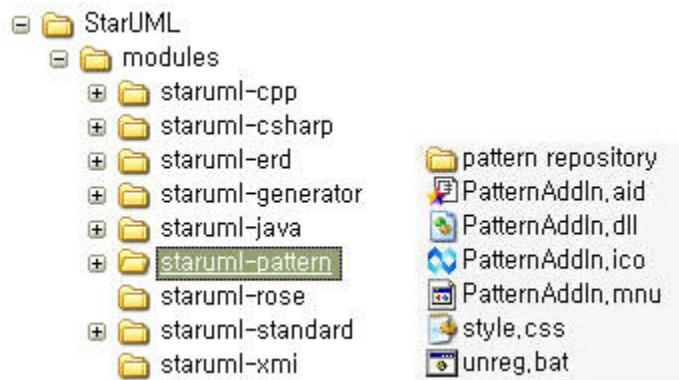
8.2 Uninstalling Modules

Uninstalling a Module including in Add In

In the case of a module including in AddIn, the directory in the module has .aid file, and there is stating a path of the AddIn in AID file. These modules provide their uninstall methods. In case of

Core Module in WhiteStarUML, unreg.bat file is existed in under the relative module directory to remove installed addin. The user can remove the installed AddIn as executing unreg.bat. And the relative module.

1. Move to Uninstalling a Module



2. Run unreg.bat in under the module directory



3. Removing the relative module directory.

Uninstalling a Module exclude in AddIn

In the case of a module exclude in AddIn, the user can uninstall for the installed module by removing the relative module directory.

Chapter

9

9 Generating Code and Documents

What is Generator?

WhiteStarUml Generator is platform module to generate various artifacts (like as Microsoft Word, Excel, PowerPoint, and Text-based artifacts) by templates depending on UML model elements in WhiteStarUml. User can define his/her own templates and can apply many different kinds of templates to the same UML model, so user can get various artifacts automatically, easily and in fast.

 **Note:** To write your own template for code or documents, please refer to Developer Guides.

Key Features

WhiteStarUml Generator provides following features.

User-definable Template

Template can be defined by user. You can write templates for .doc, .xls, .ppt directly using MS Word, MS Excel, MS PowerPoint without extra template designer.

Parameters for Template

Template provides parameters for variations of user environments, objectives, and so on. Through parameterized template, you can eliminate inconvenience and can avoid defining a new template caused by a little difference.

Batch processing to generate many artifacts at once

You can generate many kinds of artifacts at once using Batch feature. You can register many templates as a Batch and can generate it at once. Using Batch, a large amount of artifacts can be generated without waiting so you can take a rest.

Support native-styles of MS Word like as Header/Footer

You can put generation commands in Header/Footer in MS Word template and can use MS Word's native styles in the template.

Support MS Excel Sheets

You can collect various data from UML model and can insert the data into the Cells of Excel Sheet.

Using it, you can get good reports by using Graph, Filtering, Sorting and other functions in the Excel.

Support MS PowerPoint Slides

It is allowed to generate slides by hierarchical structure in MS PowerPoint. There is no restriction making PowerPoint slides, so you can generate various slides for presentation automatically with reduction of writing efforts.

Support Anything of text-based artifacts

You can generate any text-based artifacts like as XML, HTML, Source Codes (Java, C#, C++, ...), DB Schema, and so on.

See also:

- Generating with Templates
- Using Batches
- Installing and Uninstalling Templates

9.1 Generating with Templates

Generating by Template

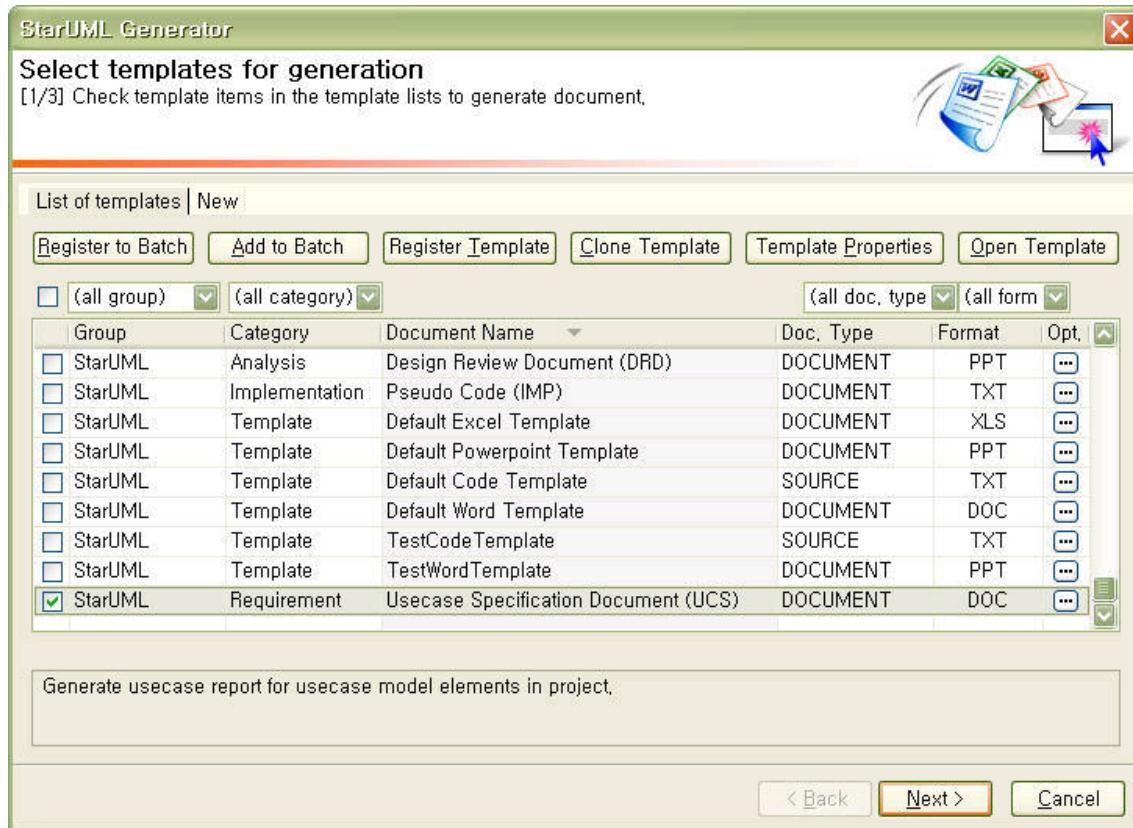
Generating Artifacts

To generate artifacts by template, it must be applicable to current working UML model.

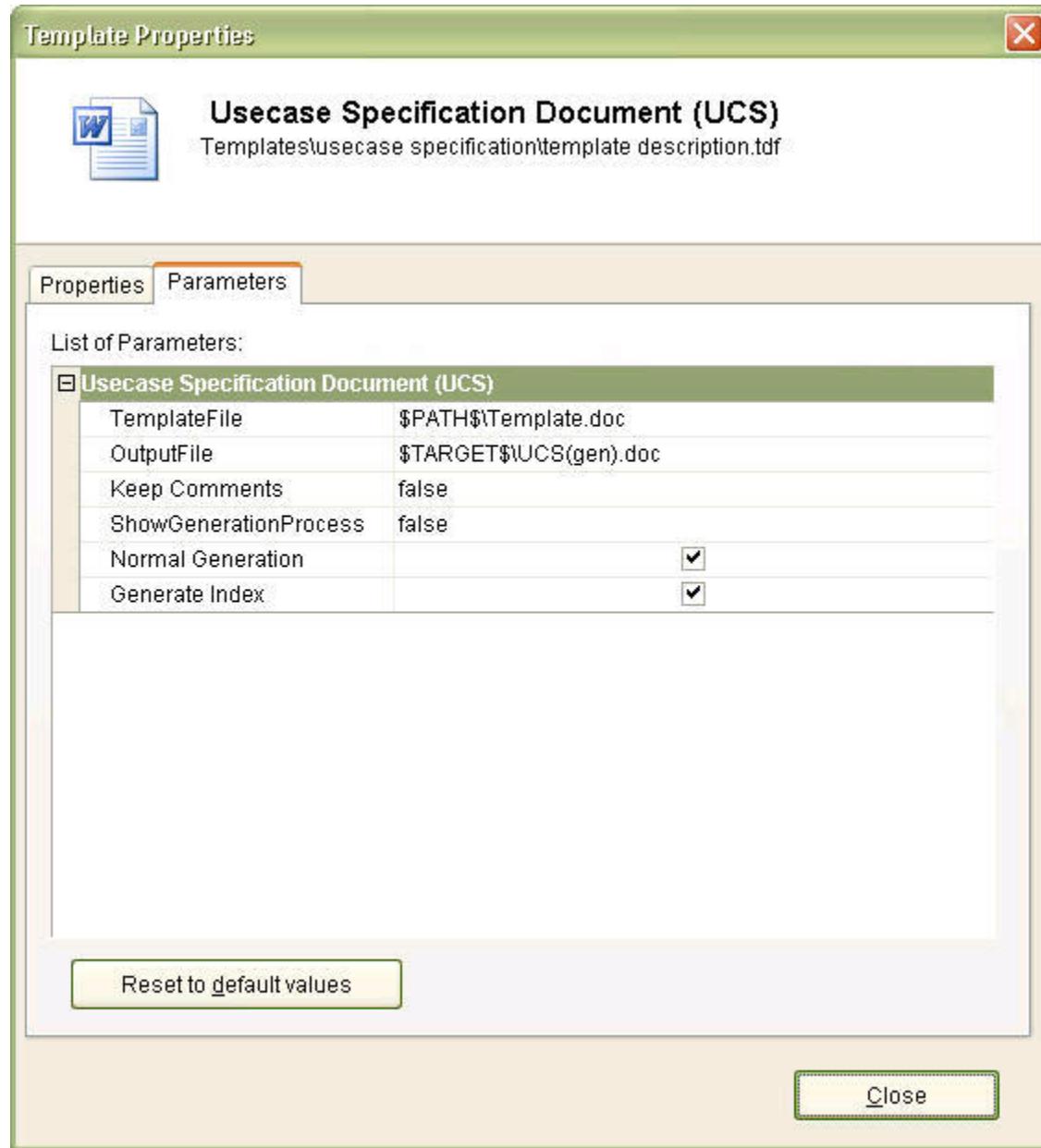
1. Select **[Tools]->[WhiteStarUML Generator...]** Menu



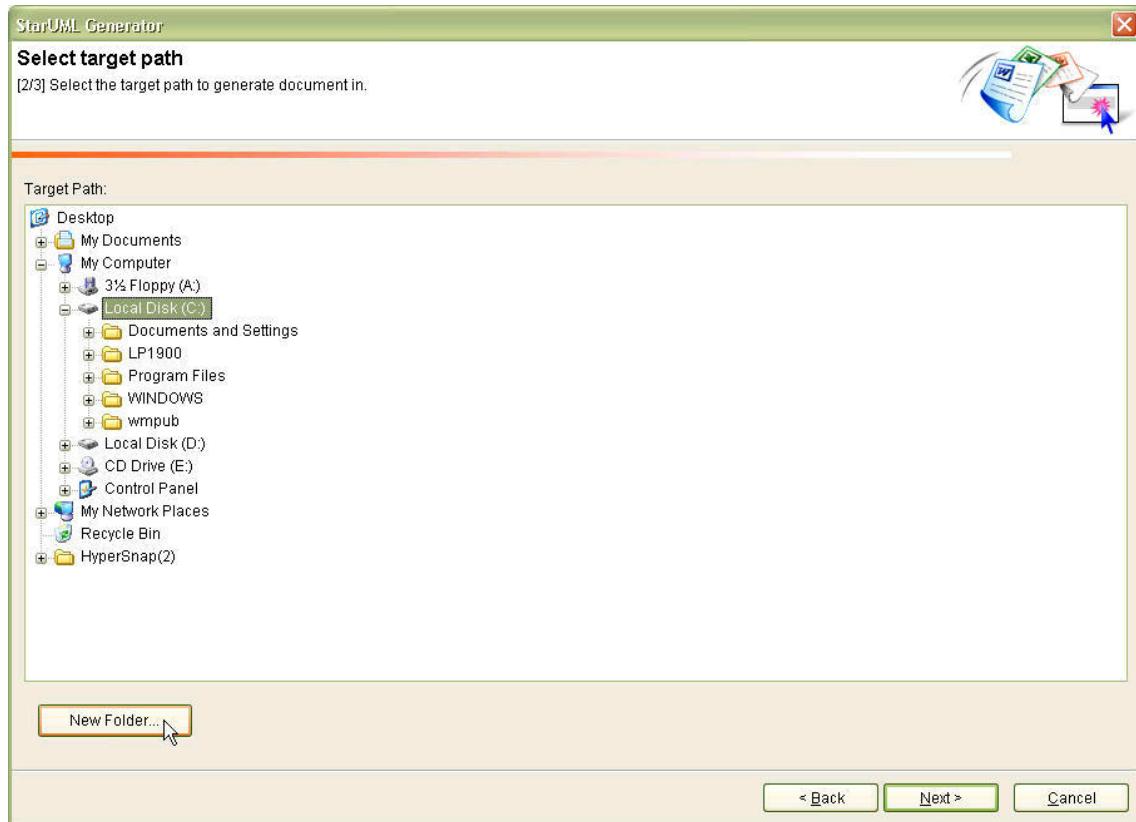
2. In the **[Select templates for generation]** Page, Check templates to generate in the ListBox and Click **[Next]** Button.



3. To bind values with parameters, Click Button of each template item in the ListBox, and set values of parameter as you want. (Refer to **Registering Template** for more information about template parameters)



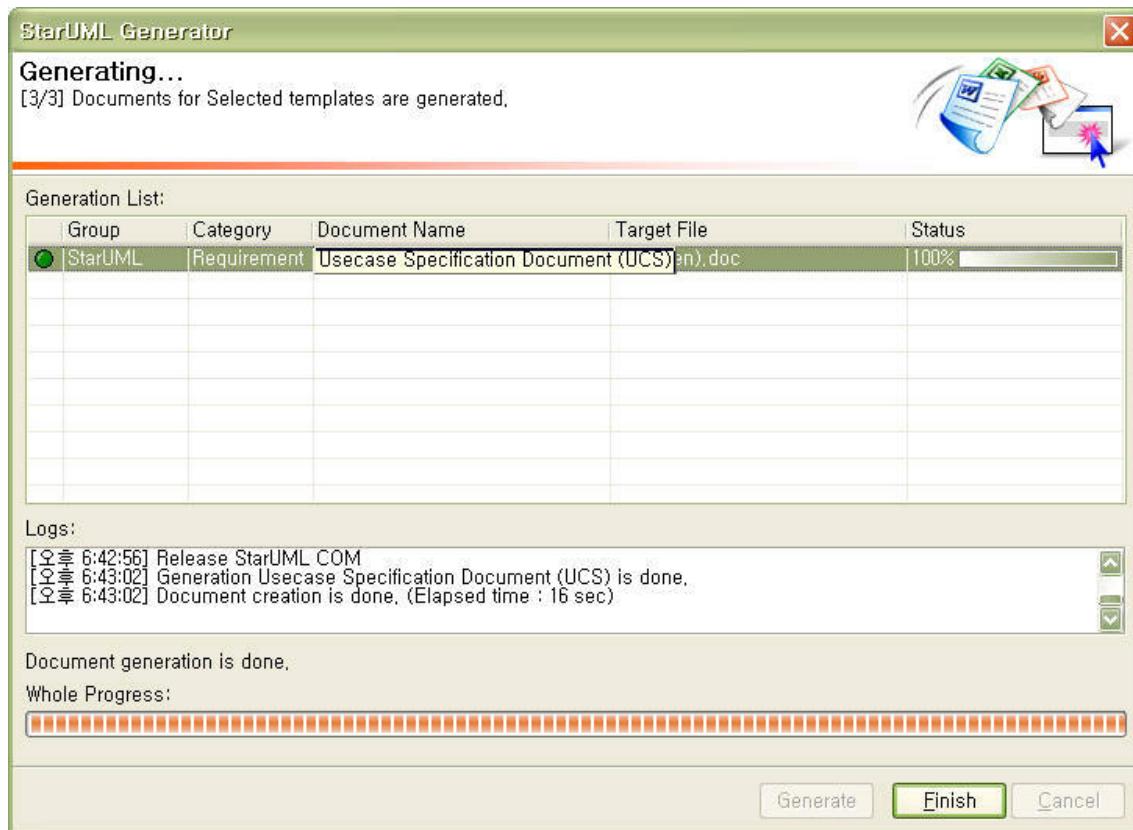
4. In the **[Select target path]** Page, Select a folder that generated artifacts will be placed and click **[Next]** button.



If you want to create a new folder, click [**New Folder...**] button and input name of the new folder.



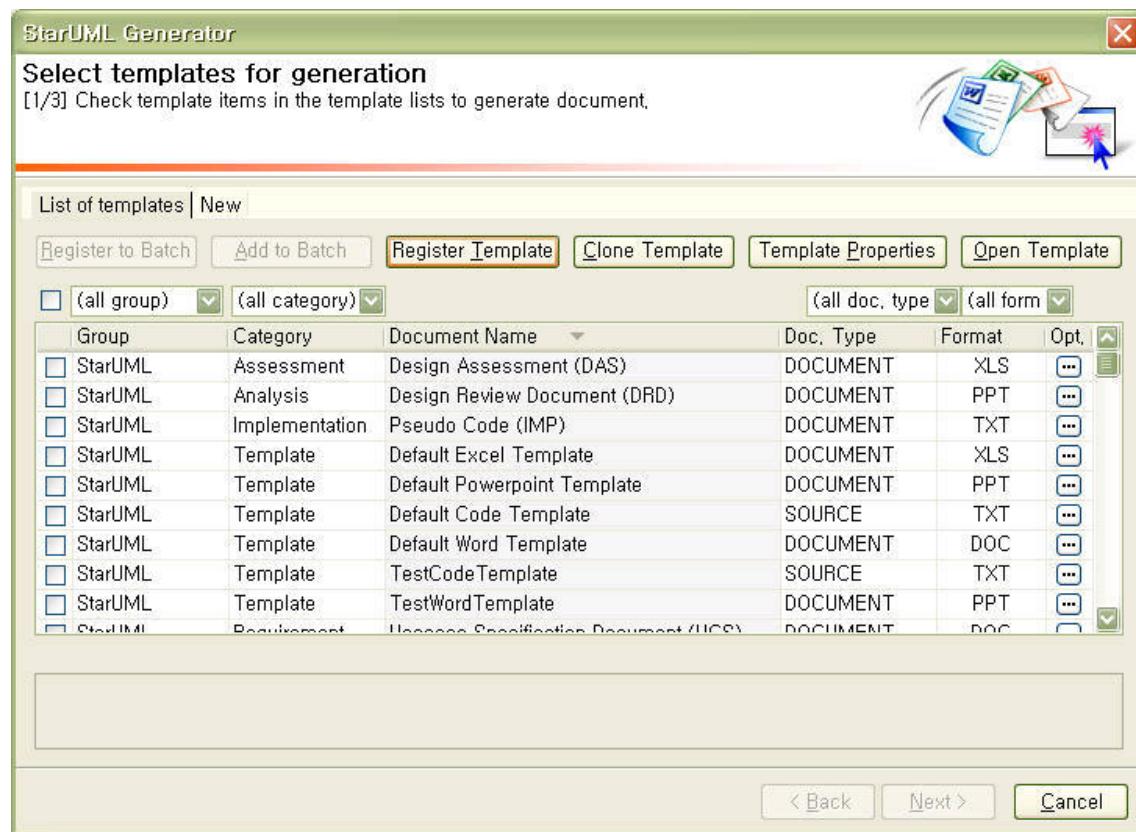
5. In the [**Generating...**] Page, click [**Generate**] button. You can check the progress of generation and it will be logged on **Logs**. If you want to cancel the generation process, click [**Cancel**] button. When all artifacts are successfully generated, [**Finish**] will be enabled and clicking it will finish the artifact generation. To see generated artifacts, double-click the item that want to see in the [**Generation List**] then the generated artifact will be opened.



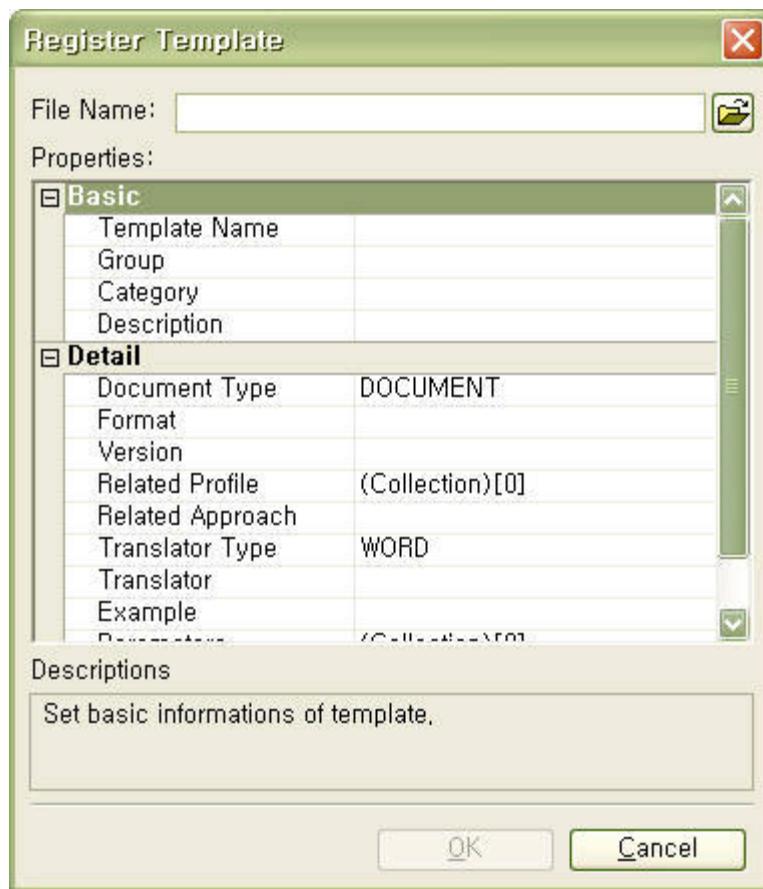
Registering a Template

Your own templates can be registered in WhiteStarUML Generator.

1. In the **[Select templates for generation]** Page, click **[Register Template]** button.



2. In the **[Register Template]** Dialog, click button and select a folder that the template files will be placed.



3. Input template information on **[Properties:]** and click **[OK]** button to complete registering a template.

[Basic] property section

Basic properties for template registration.

Property	Description
Template Name	Name for the template to register.
Group	Group name for the template. There is no restriction to name a group but to group a set of template, give the same group name for the set of templates. (it is used for horizontal classification like as RUP, CBD, <ModuleName>, <CompanyName>, ...)
Category	Category name for the template. There is no restriction to name a category but to categorize a set of template, give the same category name for the set of templates. (it is used for vertical classification like as Requirements, Design, Code, Analysis, ...)
Description	Brief description of the template.

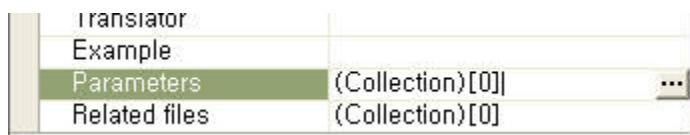
[Detail] property section

Detailed properties for template registration.

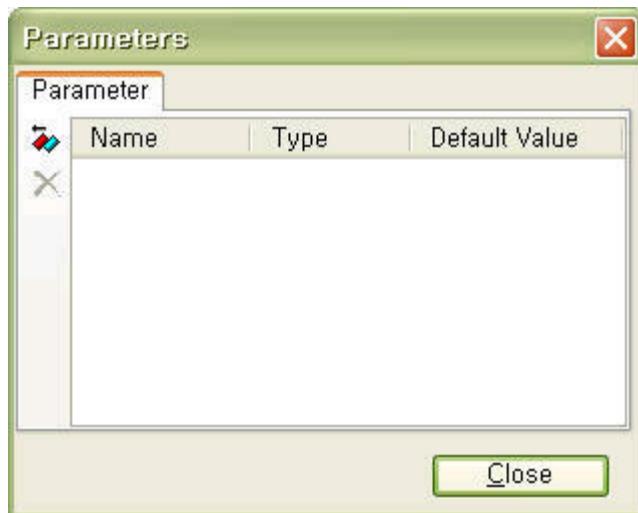
Property	Description
Document Type	Type of the template. Select DOCUMENT or CODE.
Format	Type of generated artifact. Input the format name or select one of the already defined formats (TXT, DOC, PPT, XLS)
Version	Version of the template (e.g) 1.0
Related Profile	Profiles related to the template.
Related Approach	Approach related to the template. (it is a declarative property, so it will not effect anything)
Translator Type	Kind of translator for the template. Select one of the following: WORD, EXCEL, POWERPOINT, TEXT, COM(user-defined COM-based generator), SCRIPT(user-defined scripts like as JScript, VBScript, ...), EXE(user-defined .EXE-based generator).
Translator	Specify filename of user-defined translator. It is used only for user want to use his/her own translator not built-in translators(WORD, EXCEL, POWERPOINT, TEXT)
Example	If any, specify an example model for the template.
Parameters	Parameters required for the template.
Related files	If any, specify all related files to the template.

[Parameters] property

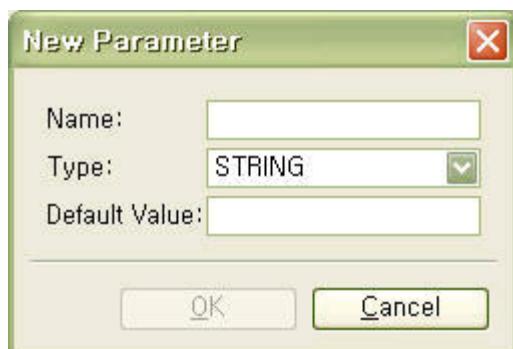
1. Click  button in Parameters property.



2. In the **[Parameters]** Dialog, click  button to create a new parameter and click  button to delete a existing parameter.



3. In the **[New Parameter]** Dialog, specify Name, Type and Default Value for the parameter and click **[OK]** button.



Default parameters are different according to the Translator Type. Following are the default parameters for each Translator Types.

Property	Type	Translator Type	Description
TemplateFile	FILENAME or STRING	WORD, EXCEL, POWERPOINT	Specify file name of the template document.
OutputFile	FILENAME or STRING	WORD, EXCEL, POWERPOINT, TEXT	Specify file name of the generated artifact.
Keep Comment	BOOLEAN	WORD, EXCEL, POWERPOINT	Specify whether to remain the comment used for generation or to delete it.
ShowGenerationProcess	BOOLEAN	WORD, EXCEL, POWERPOINT	Specify whether to show the progress of generation or not. It may affect the performance of the generation.
Normal Generation	BOOLEAN	WORD	If true, the template is applied to top-level

	N		package (Project). if false, the template is applied to the package (or element) that is currently selected in WhiteStarUml.
Generate Index	BOOLEAN	WORD	Specify whether to generate Index or not.
intermediate	STRING	TEXT	Specify file name of intermediate file used for generation.
target	STRING	TEXT	If more than two artifacts are generated, specify the pathname the artifacts are placed.

Note:

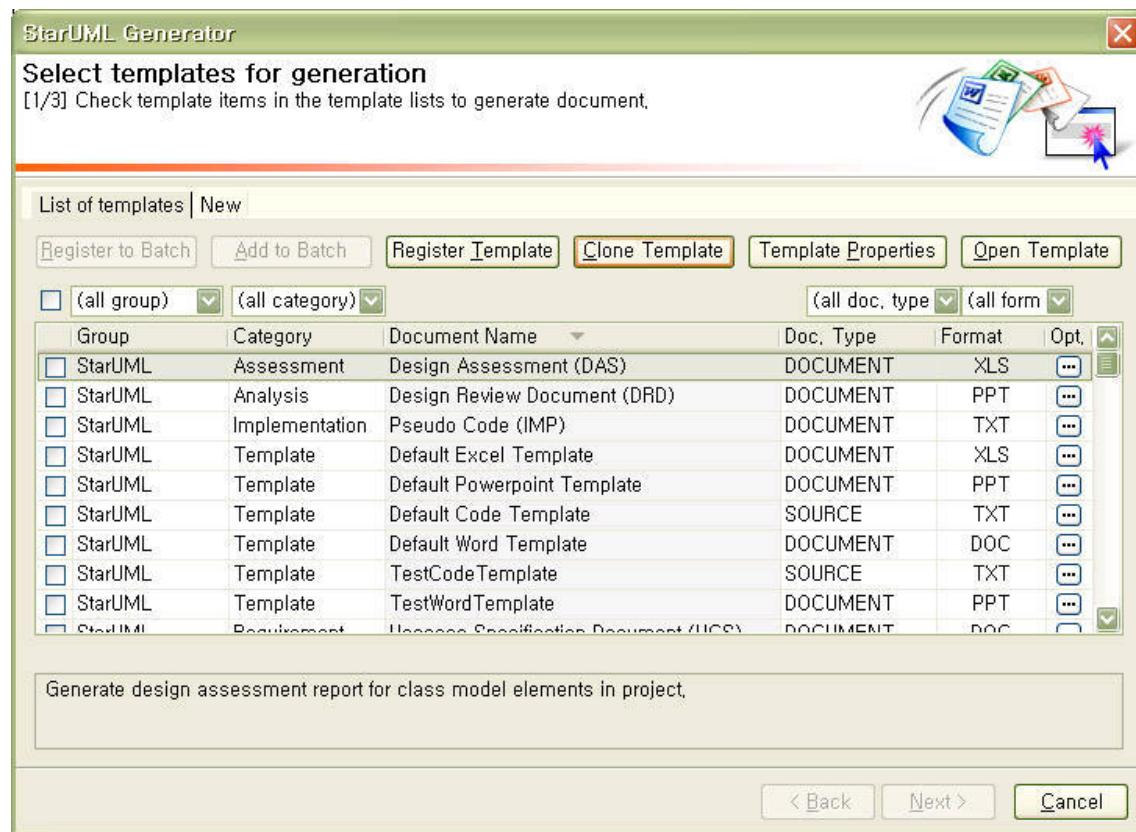
To specify file name in the parameters, environment variables is required of WhiteStarUml Generator. The variable is as follow.

Variable	Description
\$PATH\$	The path that the template files are placed. (e.g.) \$PATH\$\BusinessActorReport.doc
\$GROUP\$	Group name of the template.
\$CATEGORY\$	Category name of the template.
\$NAME\$	Name of the template.
\$TARGET\$	Output path that the user selected.

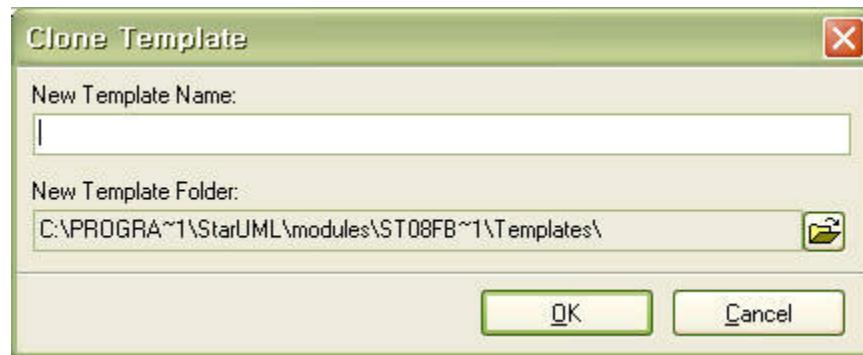
Cloning a Template

You can start to define a template by cloning an existing template without defining from the scratch.

1. In the **[Select templates for generation]** Dialog, select a template to clone and click **[Clone Template]** button, or click mouse right button on the template to clone and then click **[Clone Template]** menu on the popup menu.



2. Specify the name of cloned template and click **[OK]** button.

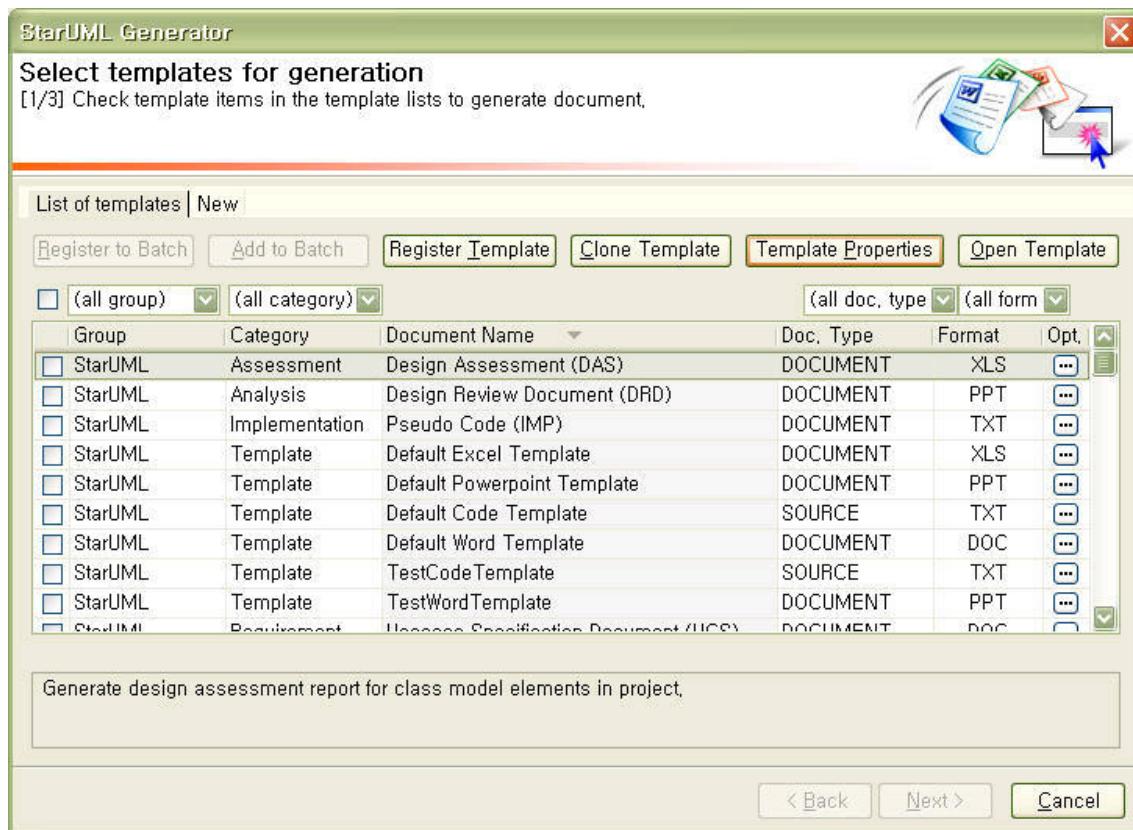


3. You can find the cloned template in the **[List of templates]**. You can edit more information of the cloned template (click **[Template Properties]** button).

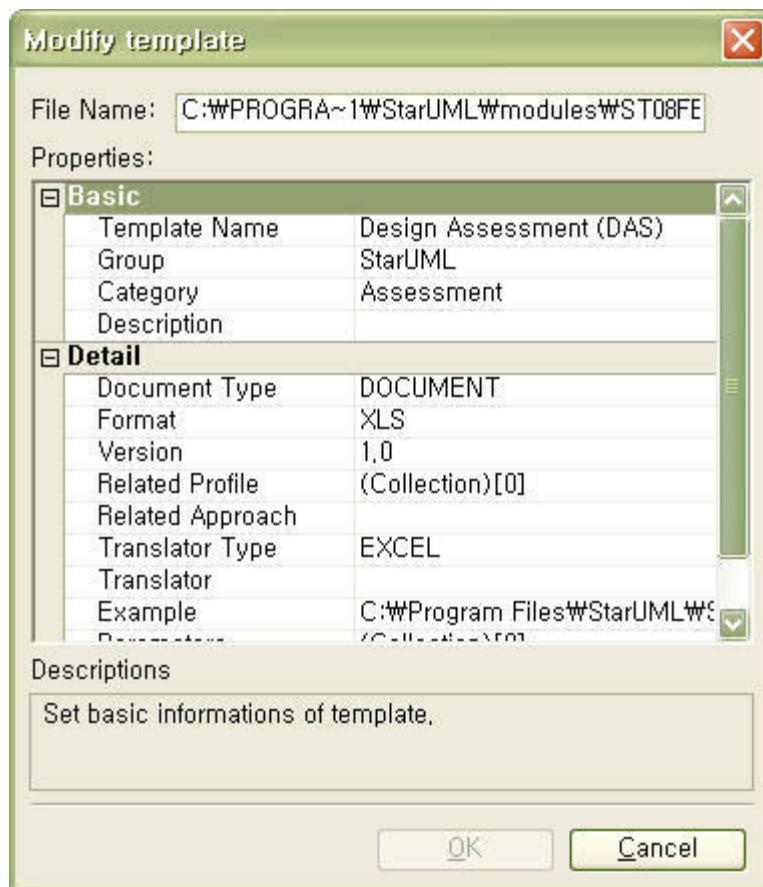
Template Properties

You can edit properties of a registered template.

1. In the **[Select templates for generation]** Dialog, select a template want to edit properties and click **[Template properties]** button, or click mouse right button on the template to edit properties and then click **[Show Template Properties]** menu on the popup menu.



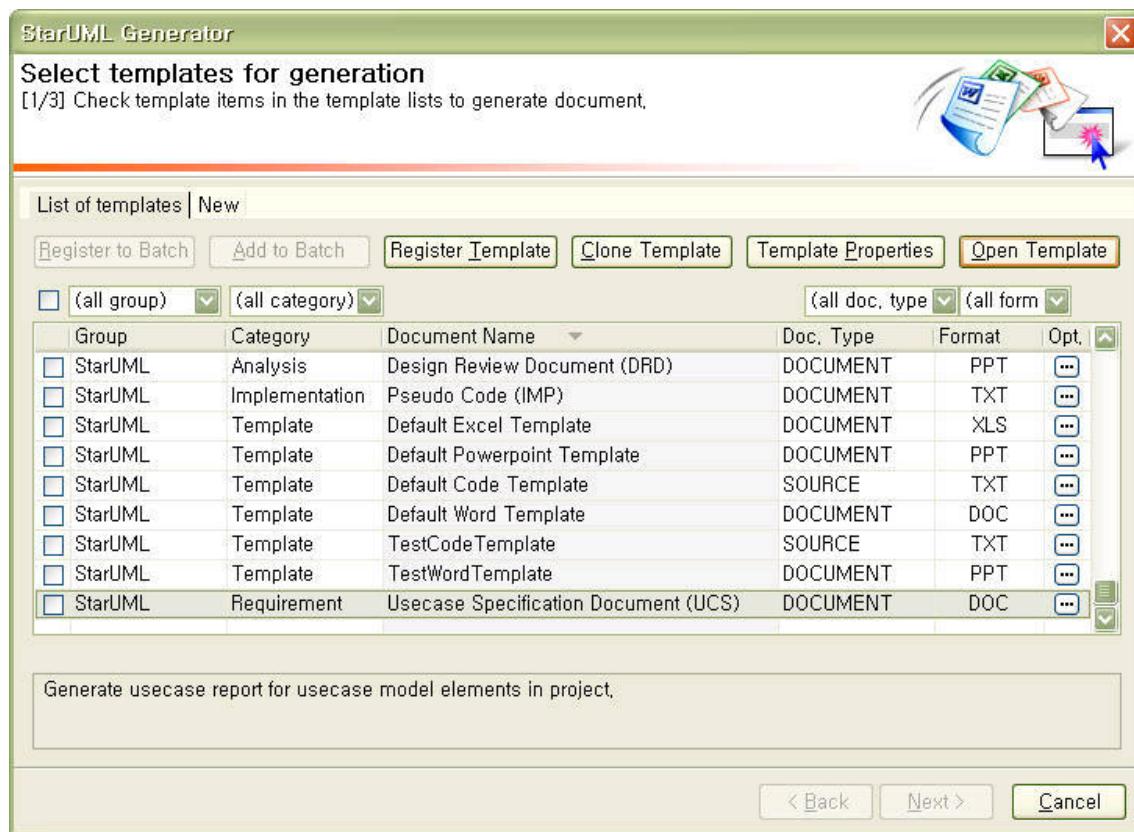
2. **Edit properties in the [Modify Template] Dialog** and click **[OK]** button. (Please refer to **Registering Template > Basic/Detail Parameters** for detailed information of each property)



Opening a Template

You can open and edit a registered template.

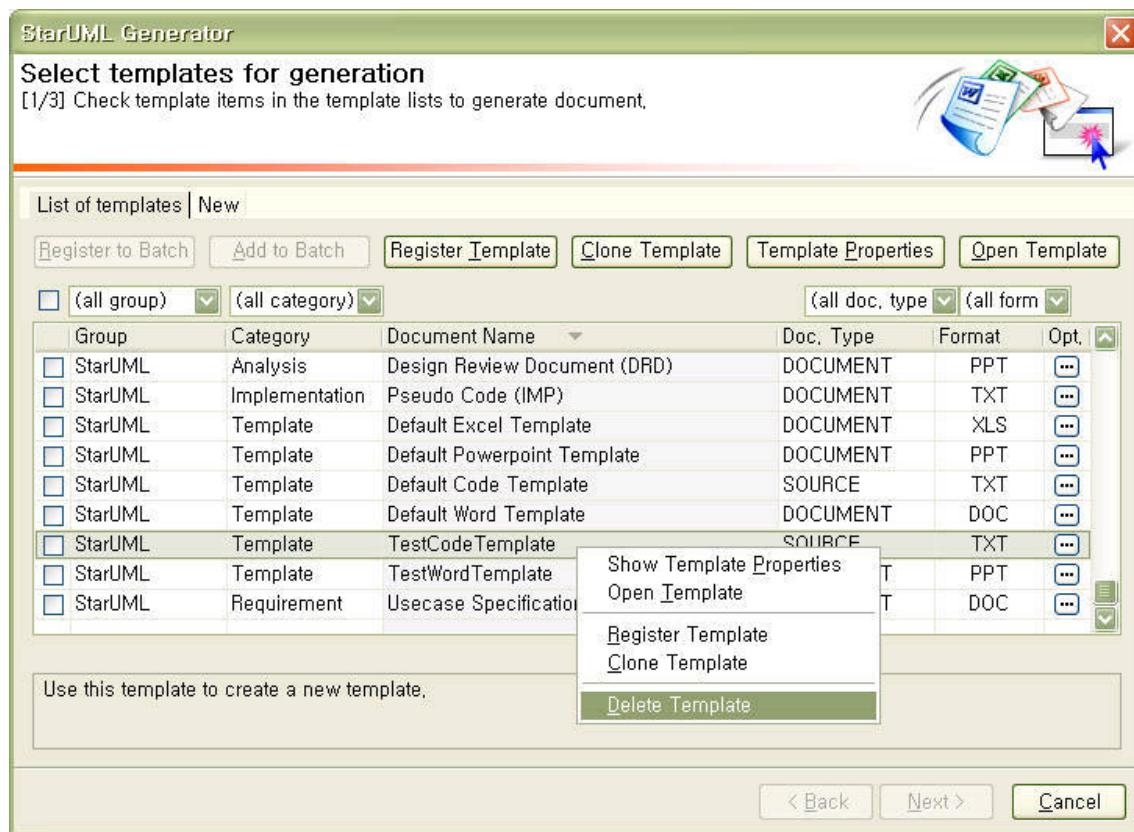
1. In the **[Select templates for generation]** Dialog, select a template to open and click **[Open Template]** button, or click mouse right button on the template to open and then click **[Open Template]** menu on the popup menu.



2. And then, the default application associated with each file extension (.cot, .doc, .xls, .ppt) will be executed and you can edit in the application. (Please refer to **WhiteStarUML 5.3.4 Developer Guides >Writing Templates** for how to write template)

Deleting a Template

- In the **[Select templates for generation]** Dialog, select a template to delete and click mouse right button and click **[Delete Template]** menu in the popup menu.



- Deleting a template causes deletion of the template folder and all files in the folder, so you must take care about deleting template.

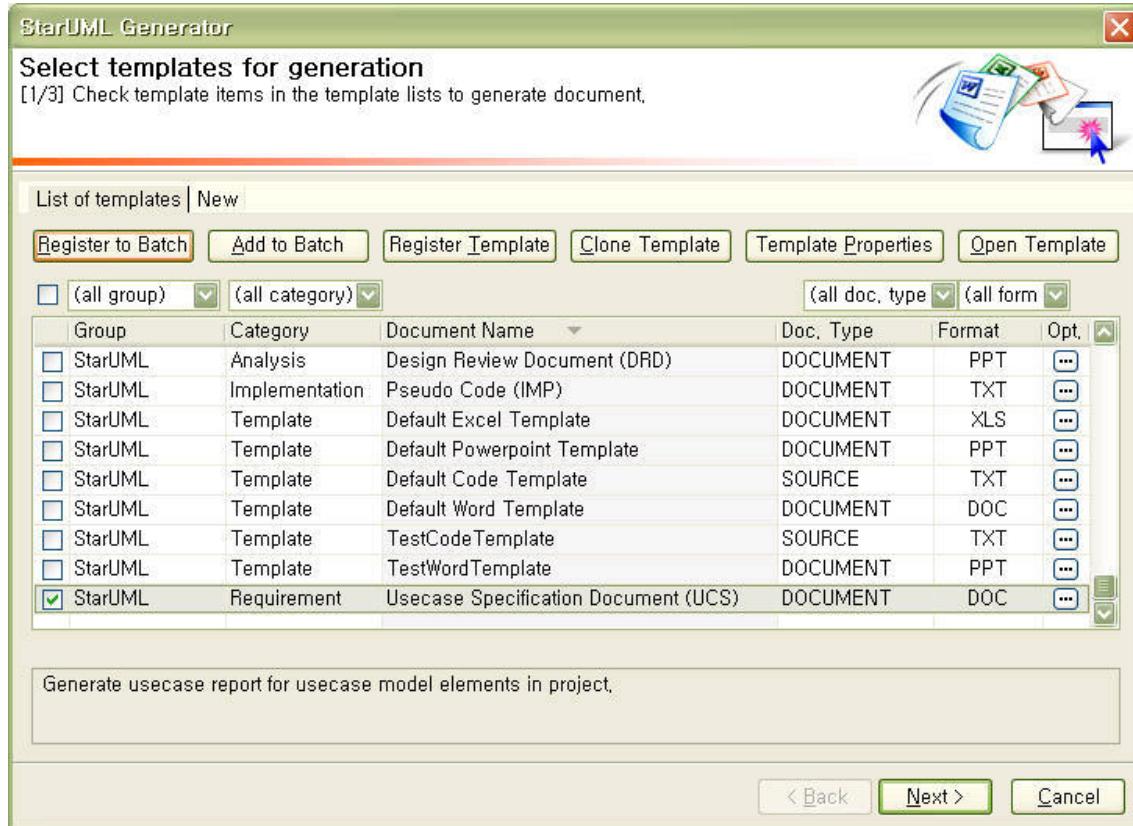
9.2 Using Batches

In the [List of templates] tab, registered templates are listed. If you want to generate a set of artifacts at once, you can make a batch that used to generate a set of artifacts and can run the batch without selecting a set of templates.

Creating a new batch

Create a new batch containing selected templates.

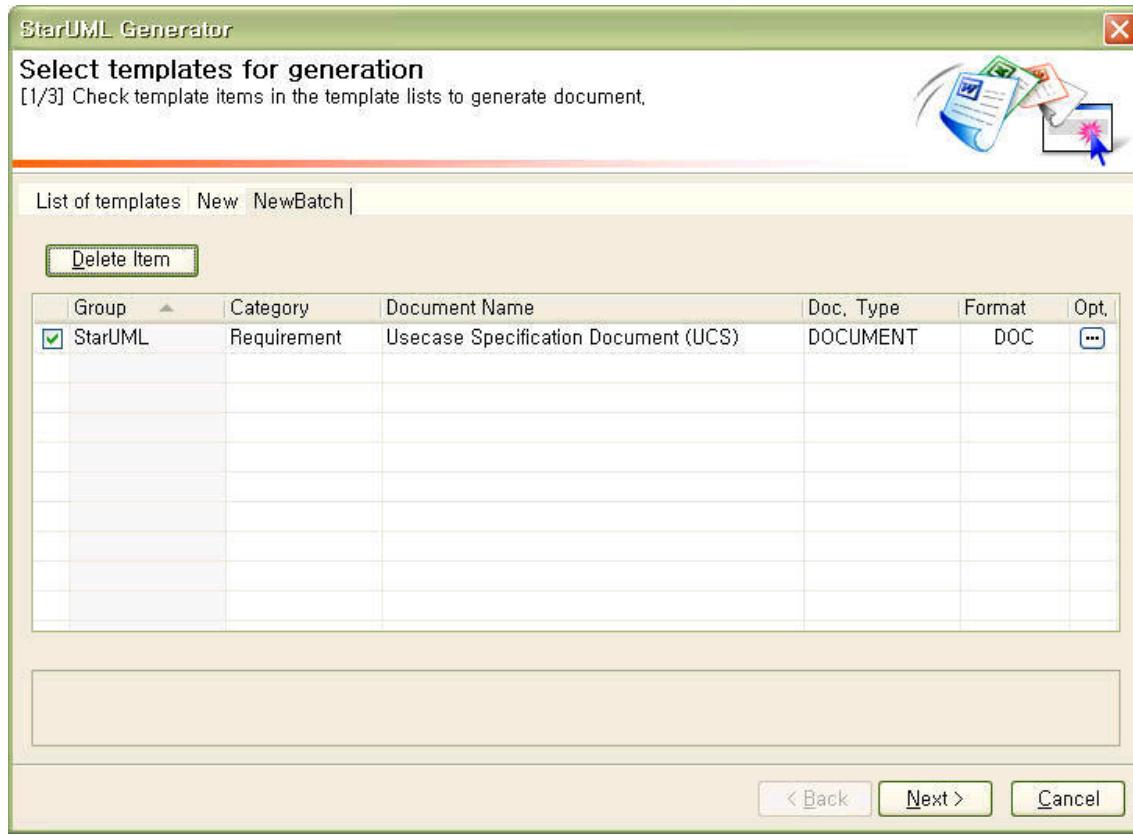
1. In the **[Select templates for generation]** Page, check templates, to make as a batch, in **[List of templates]** tab, and click **[Register to Batch]** button.



2. In the **[Register Batch]** Dialog, specify **[Batch Name]**, **[Description]** and click **[OK]** button.



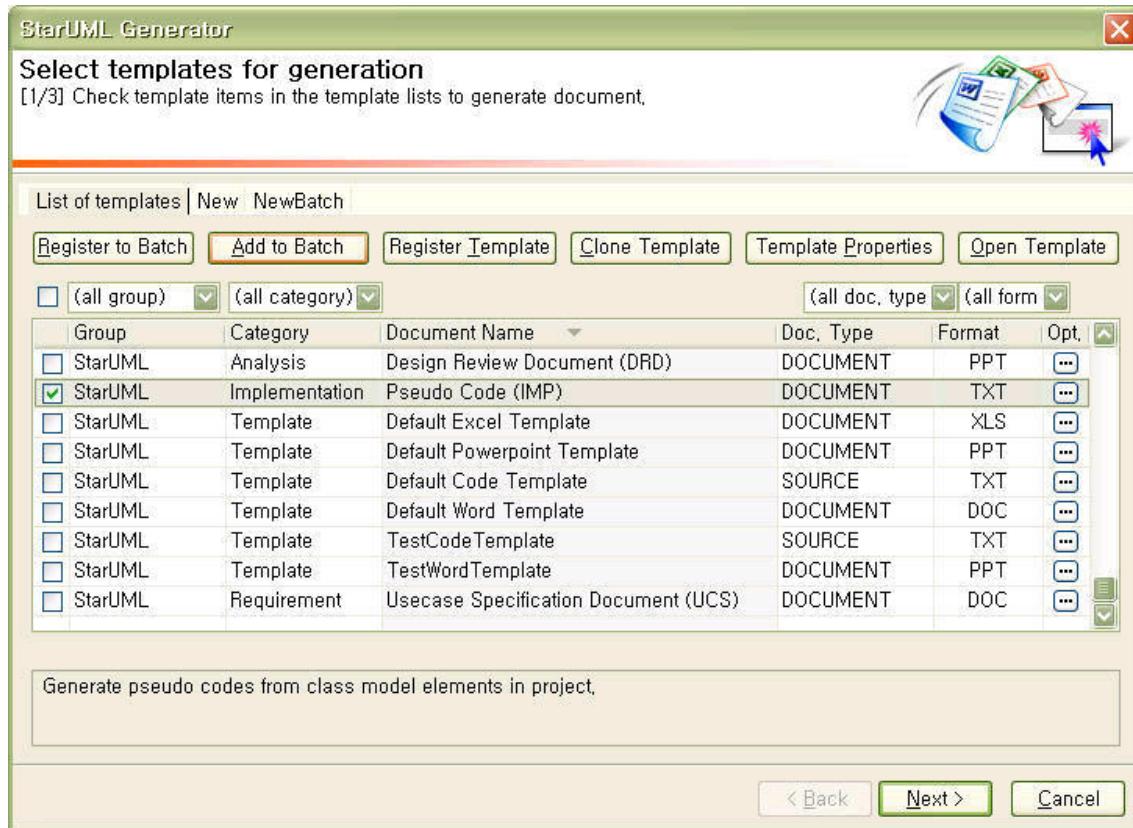
3. You can find a new batch as a tab and selected templates in template list of the batch.



Add templates to existing batch

You can add templates to an existing batch.

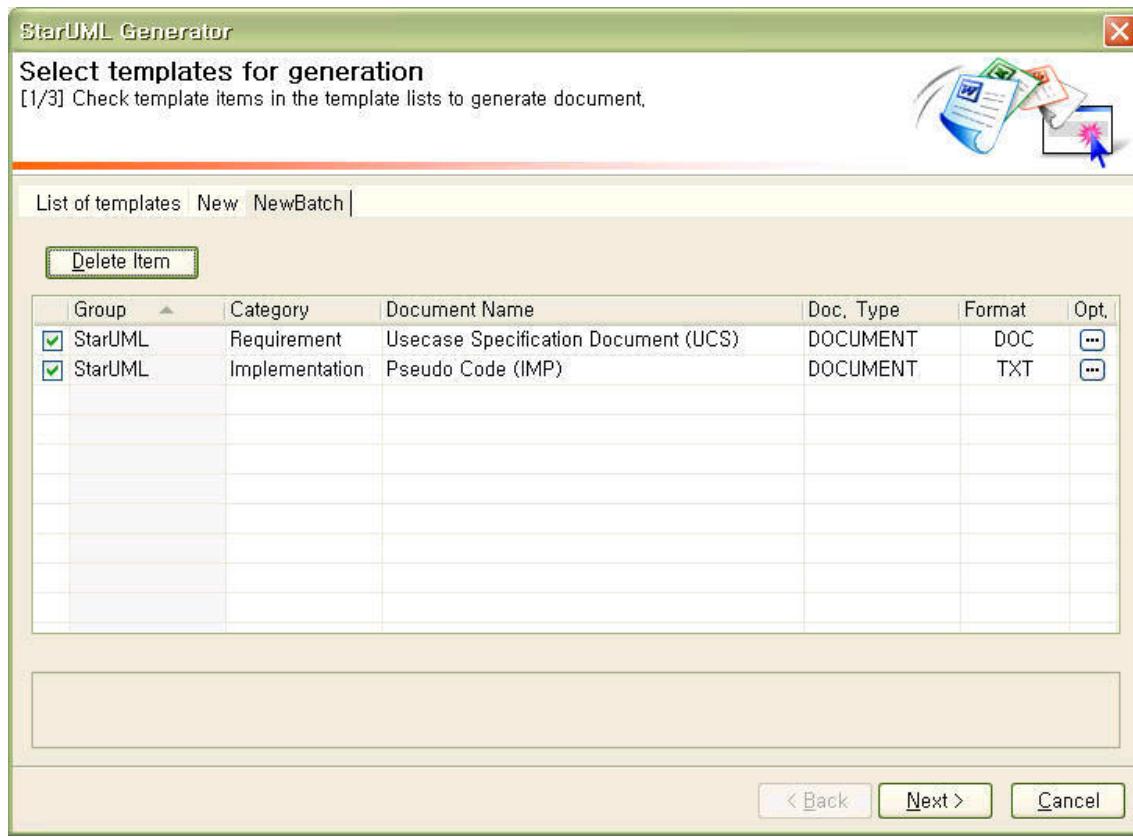
1. In the **[Select templates for generation]** Page, check templates, to add to existing batch, in the **[List of templates]** tab and click **[Add to Batch]** button.



2.In the **[Select Batch]** Dialog, select a batch and click **[OK]** button.



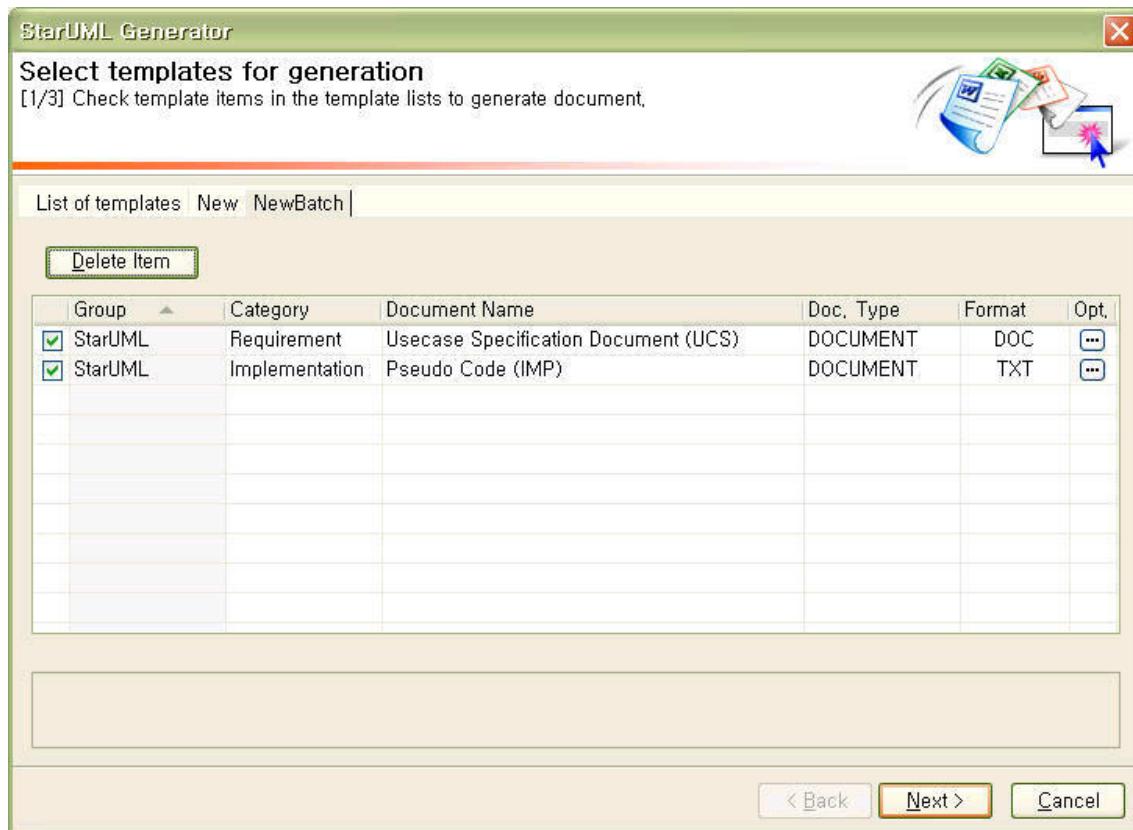
3.You can find templates added to existing batch.



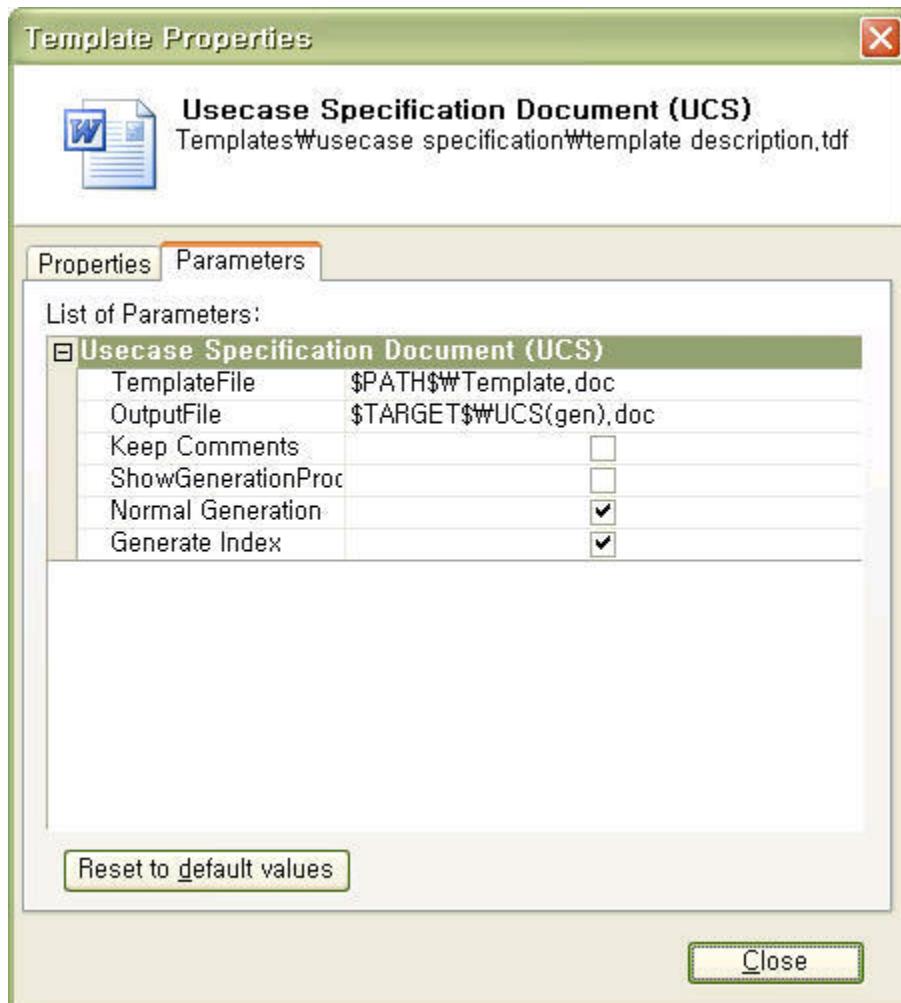
Executing a batch

You can generate many artifacts at once by using batch.

1. In the **[Select templates for generation]** Page, select batch tab to execute.
2. Check templates to generate and click **[Next]** button. (As default, all templates are checked in the batch.)



3. You can generate artifacts in the batch using different property values. If you want to do so, click [...] button of each template and set the value of the each property. The change of the properties are applied only once. (Please refer to [Registering Template > property](#) for more information about properties of template)

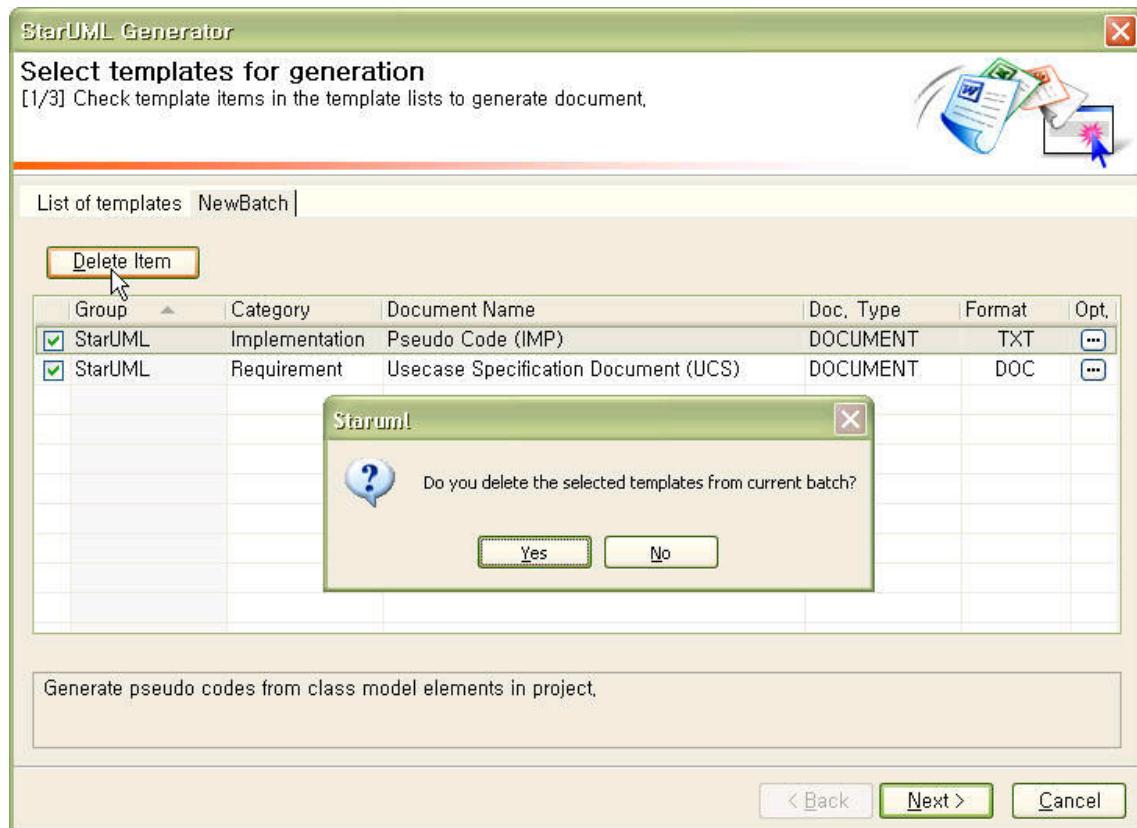


4. When [**Select target path**] page is appeared on the screen, selects a folder to save generate a document to generate, and click [**Next**]. If you want to add a folder under the present selected folder, click [**New Folder...**] button on left bottom and write a name for adding folder on name configuration dialog
5. When [**Generating...**] page is appeared on the screen, clicks [**Generate**] button. You can check the statue of each template generating through statue bar as generating documents from the template. And the log of generating process is recorded to [**Logs:**] window. If you want to cancel the present generating document, click [**Cancel**] button. And clicks OK button on Confirm cancel dialog.
6. Log(Document Creation is done) on log window is recorded, and is activated [**Finish**] button after completing document generation. If you want to finish document generation, close the document generation process as clicking [**Finish**] button. Or you can check the generated document as double-clicking document list in [**Generation List**].

Deleting templates in a batch

You can delete templates in the batch. (The deletion in the batch, the template is not remove and only deleted from the batch.)

1. In the **[Select templates for generation]** Page, go to the batch tab and check templates to remove, and click **[Delete Item]** button.

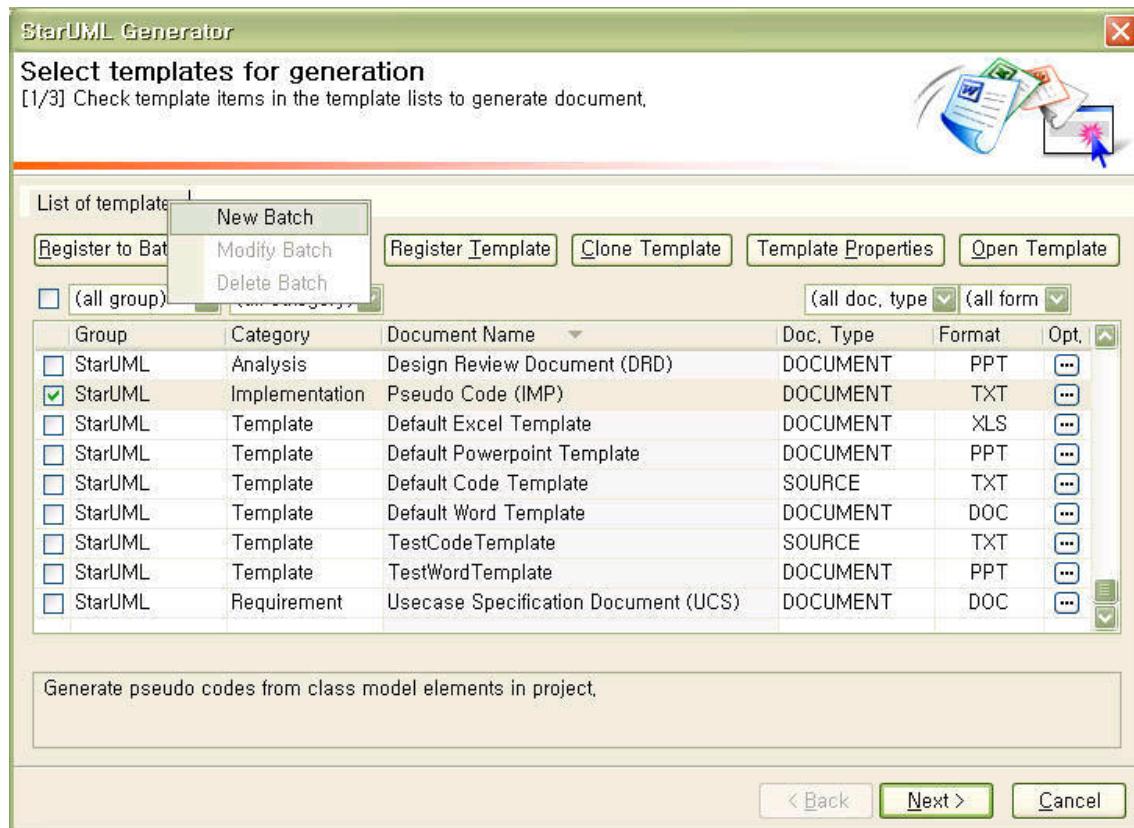


2. You can make a certain the deletion of the checked templates.

Creating an empty batch

You can create a batch that containing no template.

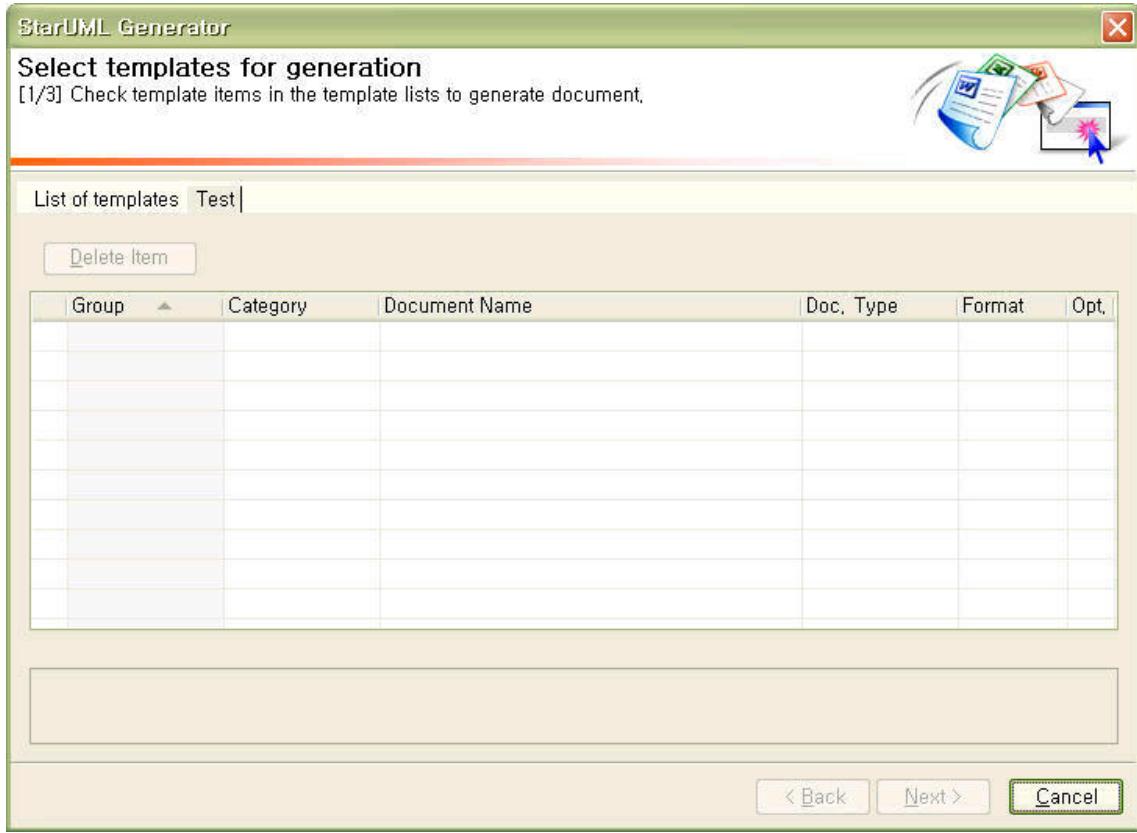
1. In the **[Select templates for generation]** Page, click mouse right button on the any tab, and click **[New Batch]** menu.



2. In the **[Register Batch]** Dialog, specify **[Batch Name]**, **[Description]** and click **[OK]** button.



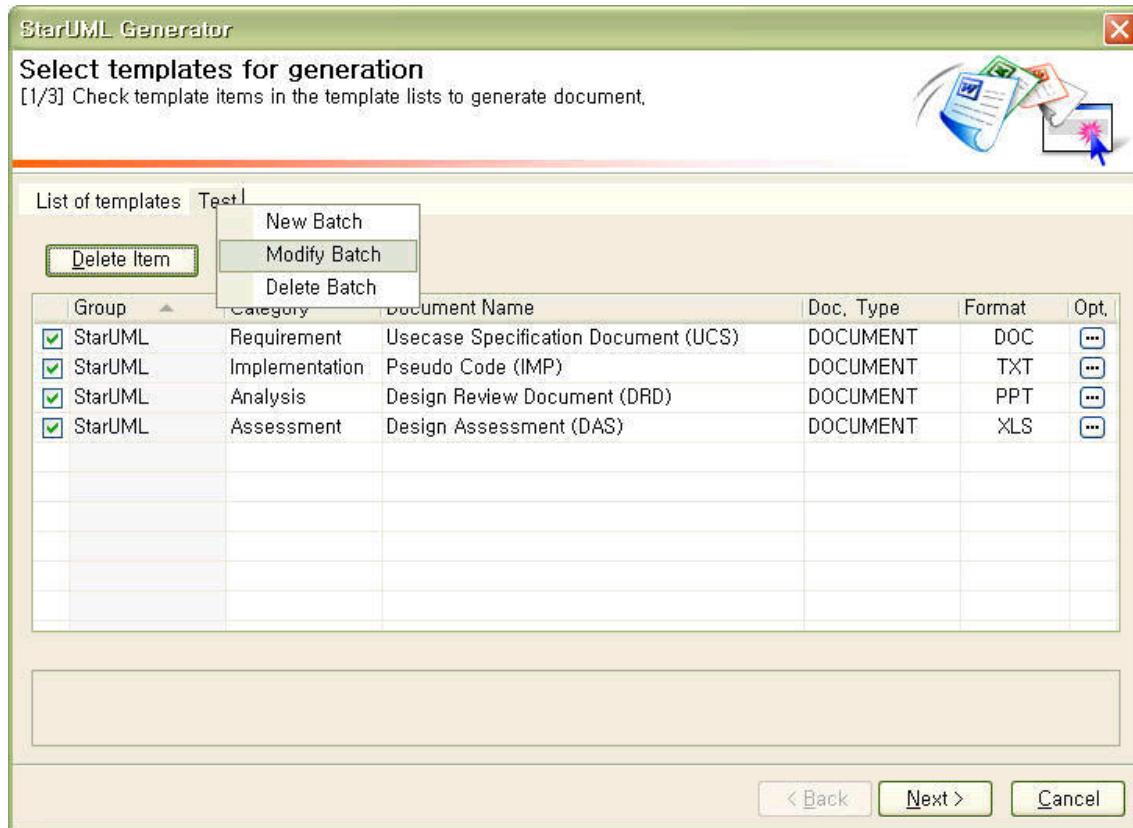
3. In the **[Select templates for generation]** Page, you can find an empty batch tab.



Modifying a batch

You can modify information about a batch.

1. In the **[Select templates for generation]** Page, select batch tab to modify, and click mouse right button and click **[Modify Batch]** menu.



2. In the **[Register Batch]** Dialog, modify **[Batch Name]**, **[Description]** and click **[OK]** button.

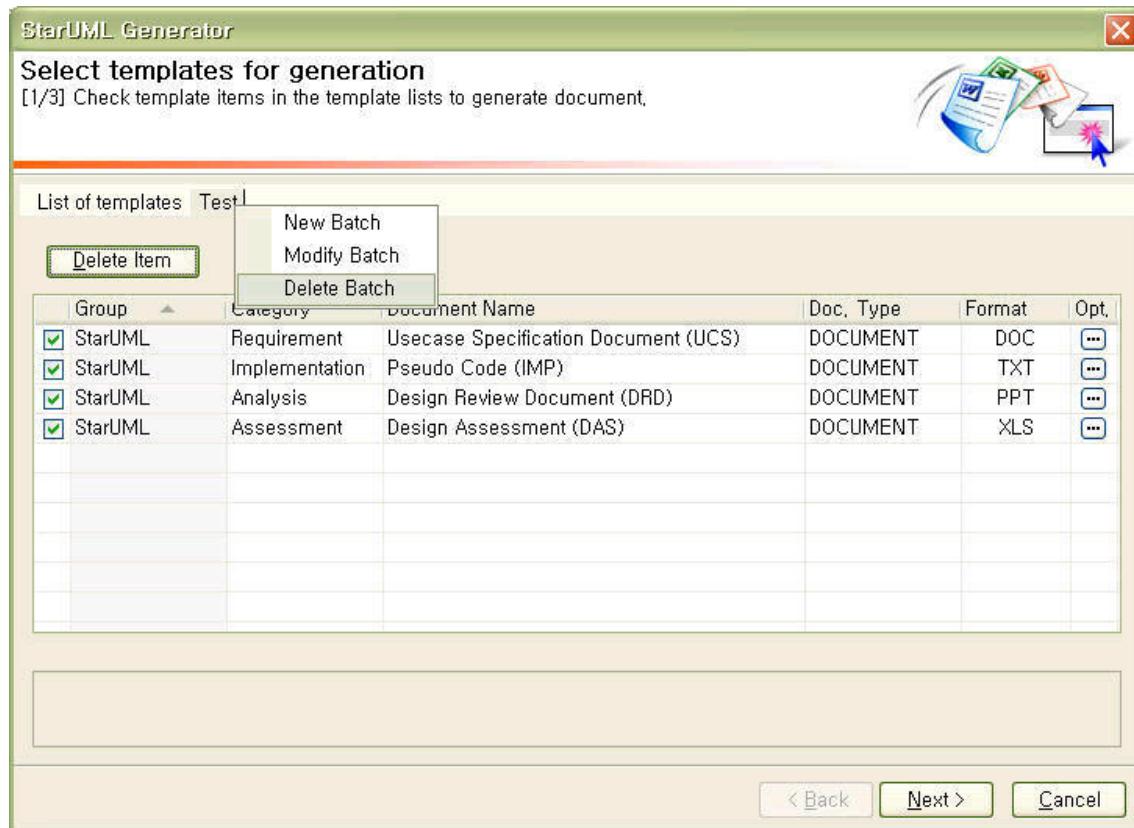


Deleting a batch

You can delete a batch.

1. In the **[Select templates for generation]** Page, select a batch tab to delete and click

mouse right button and click **[Delete Batch]** menu.



2. You can make a certain that the deletion of the batch tab (Deleting batch not cause deletion of the templates contained by the template)

9.3 Installing and Uninstalling Templates

Organization of templates

Templates are installed under the folder "<STARUML_INSTALL_PATH>\modules\staruml-generator\templates" and batches are under the folder "<STARUML_INSTALL_PATH>\modules\staruml-generator\batches". In general, one template matches one folder and the folder contains all files associated to the template. A template includes at least two files. The first is template description file (.tdf) and the second is the template document (.cot, .doc, .xls, .ppt, ...). Batch includes one file that is batch file (.btf).

Directory structure of staruml-generator module is as follow.

```
staruml-generator\
    templates\
```

```
template1\
```

```
    template1.tdf
```

```
    template1.doc
```

```
template2\
```

```
...
```

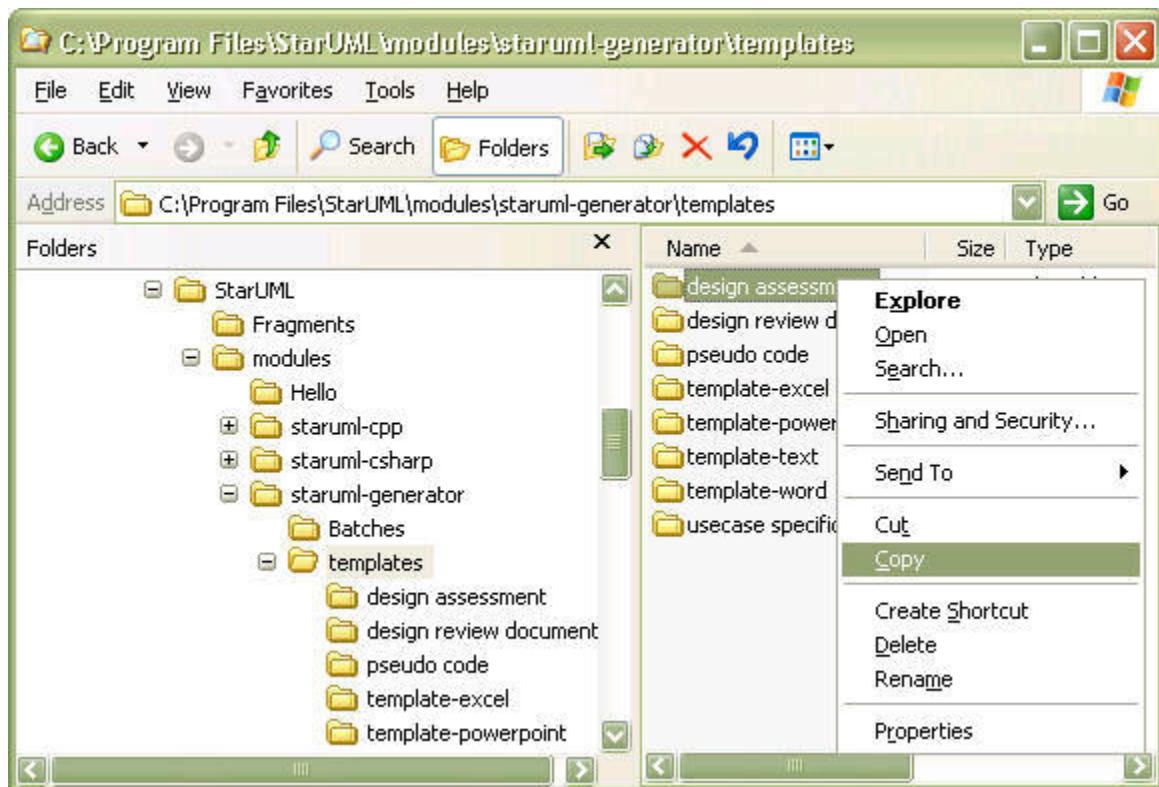
```
batches\
```

```
    batch1.btf
```

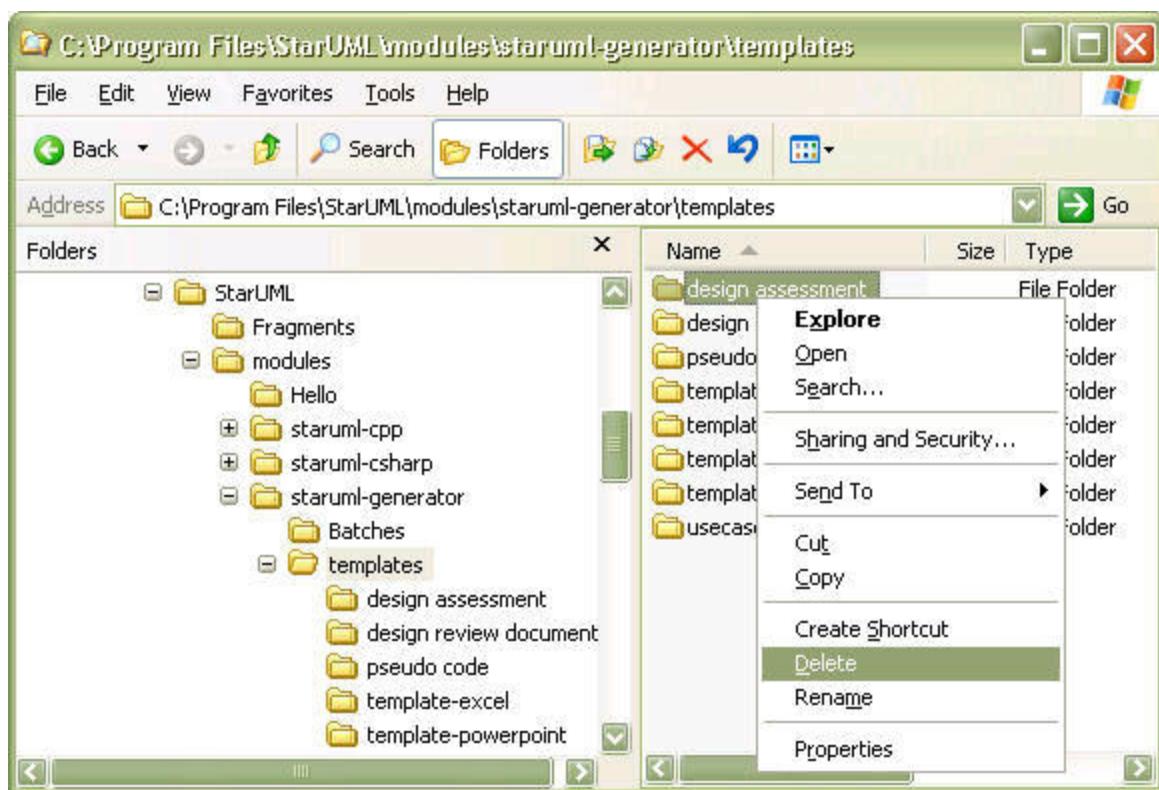
```
...
```

Installation and uninstallation of a template

Installing a template is very simple. Simply copy the template folder to the "`<STARUML_INSTALL_PATH>\modules\staruml-generator\templates`".

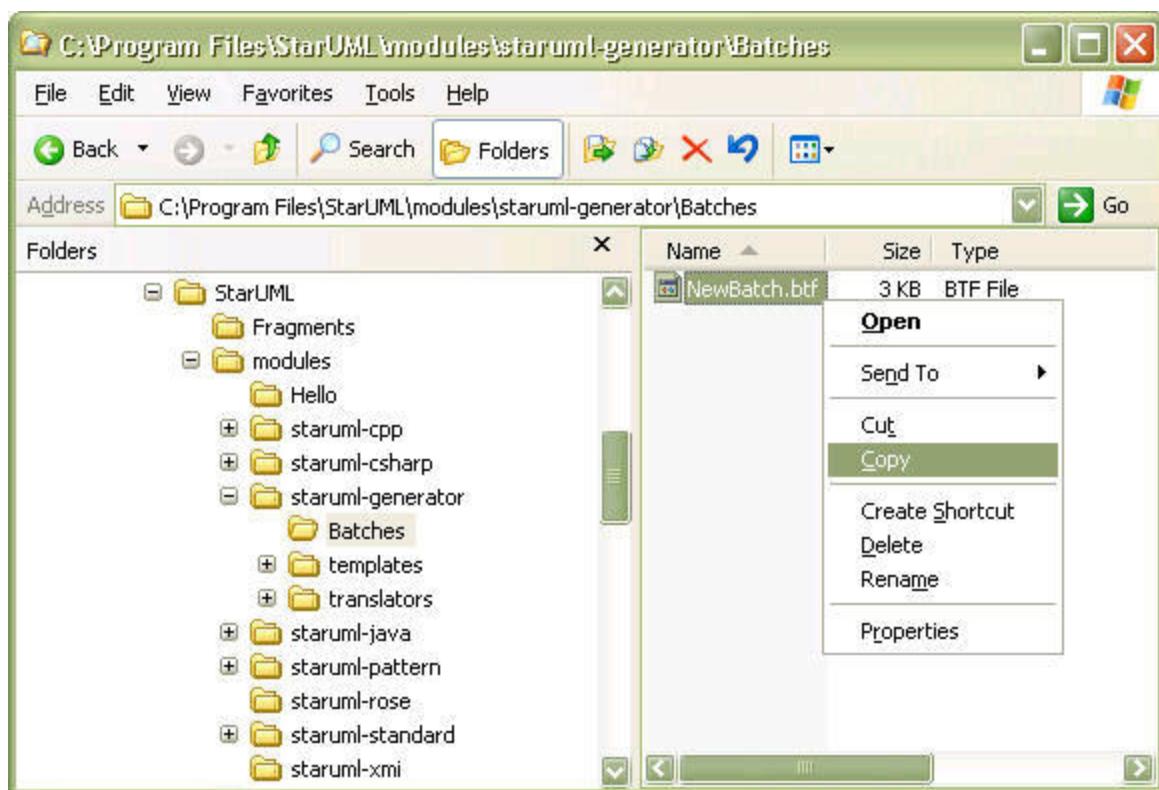


Uninstalling a template is also very simple. Delete the template folder under the "`<STARUML_INSTALL_PATH>\modules\staruml-generator\templates`". It's all.

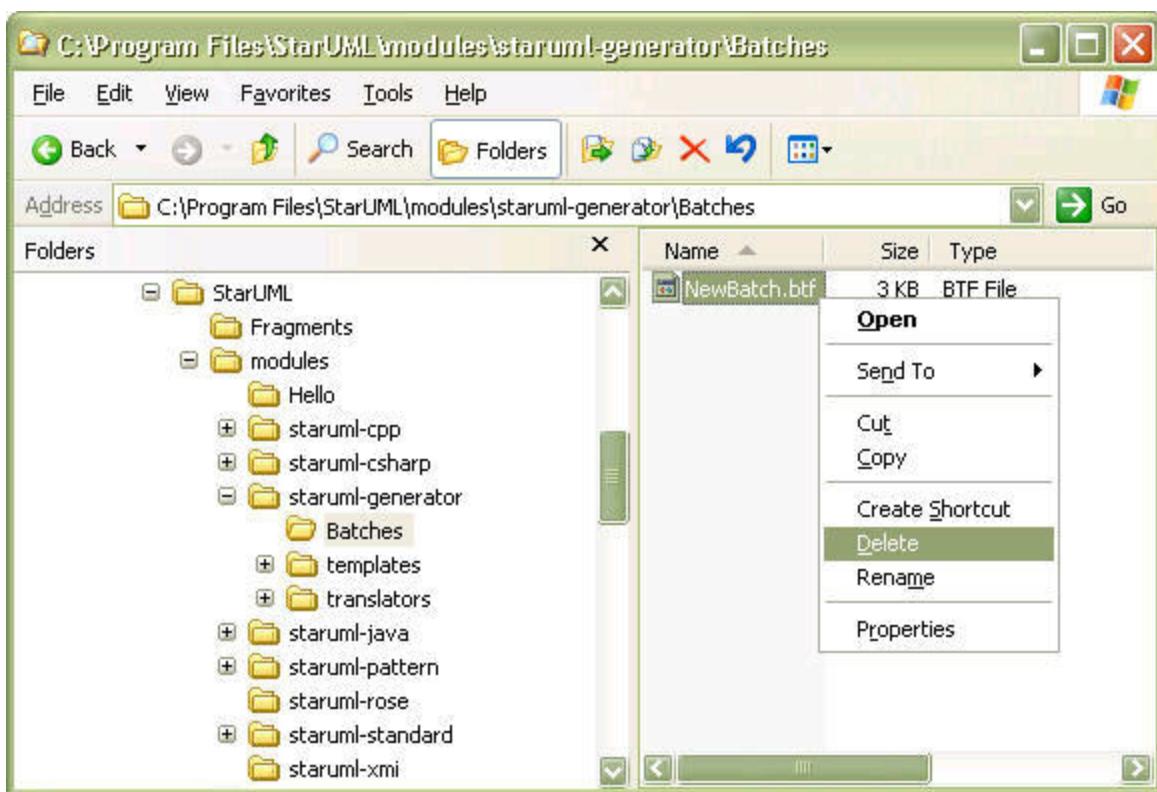


Installation and uninstallation of a batch

Installing a batch is very simple. Simply copy the batch file (.btf) to the "<STARUML_INSTALL_PATH>\modules\staruml-generator\batches".



To uninstall a batch, delete the batch file (.btf) in the "`<STARUML_INSTALL_PATH>\modules\staruml-generator\batches`".



Chapter

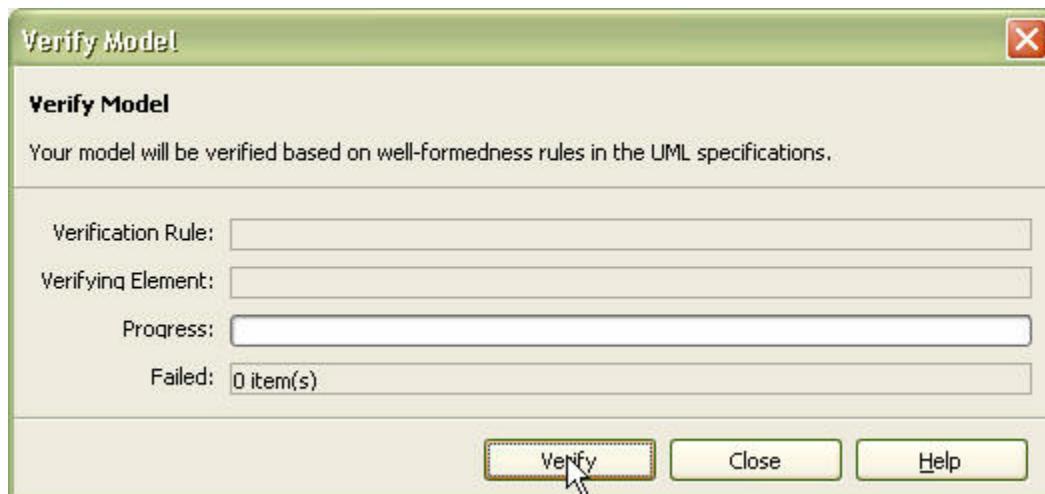
10

10 Verifying Models

Users can make many mistakes during software modeling. Such mistakes can be very costly if left uncorrected until the final coding stage. In order to prevent this problem, WhiteStarUML allows verification of software models by applying the basic UML regulations.

Procedure for Verifying Model:

1. Select the **[Model] -> [Verify Model...]** menu.
2. At the Verify Model dialog box, click the **[Verify]** button.



3. When the verification finishes, the **[Messages]** section displays the names of the elements that did not pass the verification, and their error contents. Double-click a message to move to the element concerned.

See also:

- Well-formedness Rules

10.1 Well-formedness Rules

Thirty-eight regulations are defined for verifying models. These definitions are mostly adaptations of the Well-formedness Rule in the UML specification.

Model Verification Regulation List

No	Regulation Contents	Elements Applied
1	AssociationEnds within an Association must have unique names.	Association

2	Two or more Aggregations or Composite AssociationEnds cannot exist within an Association.	Association
3	Parameters must have unique names.	BehavioralFeature
4	Attributes of the same name cannot exist within a Classifier.	Classifier
5	AssociationEnds on the other side must have unique names.	Classifier
6	An Attribute cannot have the same name as the Association on the other side, or as elements included in Classifier.	Classifier
7	AssociationEnd on the other side cannot have the same name as elements included in Classifier or its Attribute name.	Classifier
8	Root element cannot have elements that are more generalized than itself.	GeneralizableElement
9	Leaf element cannot have elements that are more specialized than itself.	GeneralizableElement
10	Looped inheritance structure is not allowed.	GeneralizableElement
11	All features of interfaces must be public.	Interface
12	ComponentInstance must accurately assign a component as its origin.	ComponentInstance
13	NodeInstance must accurately assign a node as its origin.	NodeInstance
14	AssociationEndRole must be	AssociationEndRole

	connected with ClassifierRole.	
15	ClassifierRole cannot have its own features.	ClassifierRole
16	ClassifierRole cannot become the ClassifierRole for another ClassifierRole.	ClassifierRole
17	Sender and receiver of a message must participate in the collaboration that constitutes the interaction context.	Message
18	Actor can only have associations that are connected to UseCase, Class or Subsystem.	Actor
19	CompositeState can have a maximum of one initial state only.	CompositeState
20	CompositeState can have a maximum of one deep history only.	CompositeState
21	CompositeState can have a maximum of one shallow history only.	CompositeState
22	Concurrent composite state must contain a minimum of two composite states.	CompositeState
23	Concurrent state can only have composite state as its sub state.	CompositeState
24	Final state cannot have outgoing transition.	FinalState
25	Initial state can have a maximum of one outgoing transition and cannot have incoming transition.	Pseudostate

26	History state can have a maximum of one outgoing transition.	Pseudostate
27	Junction vertex must have a minimum of one incoming transition and one outgoing transition each.	Pseudostate
28	Choice vertex must have a minimum of one incoming transition and one outgoing transition each.	Pseudostate
29	StateMachine can be integrated either with Classifier or with BehavioralFeature.	StateMachine
30	Top state must always be composite state.	StateMachine
31	No state can contain top state.	StateMachine
32	Top state cannot have outgoing transition.	StateMachine
33	SubmachineState cannot have concurrency.	SubmachineState
34	Transition that points to Pseudostate cannot have Trigger.	Transition
35	ActivityGraph can express dynamic behavior of Package, Classifier or BehavioralFeature.	ActivityGraph
36	ActionState cannot have internal transition, exit action or do activity.	ActionState
37	Outgoing transition of ActionState cannot have trigger event.	ActionState
38	SubactivityState must have	SubactivityState

	connection to ActivityGraph.	
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Chapter

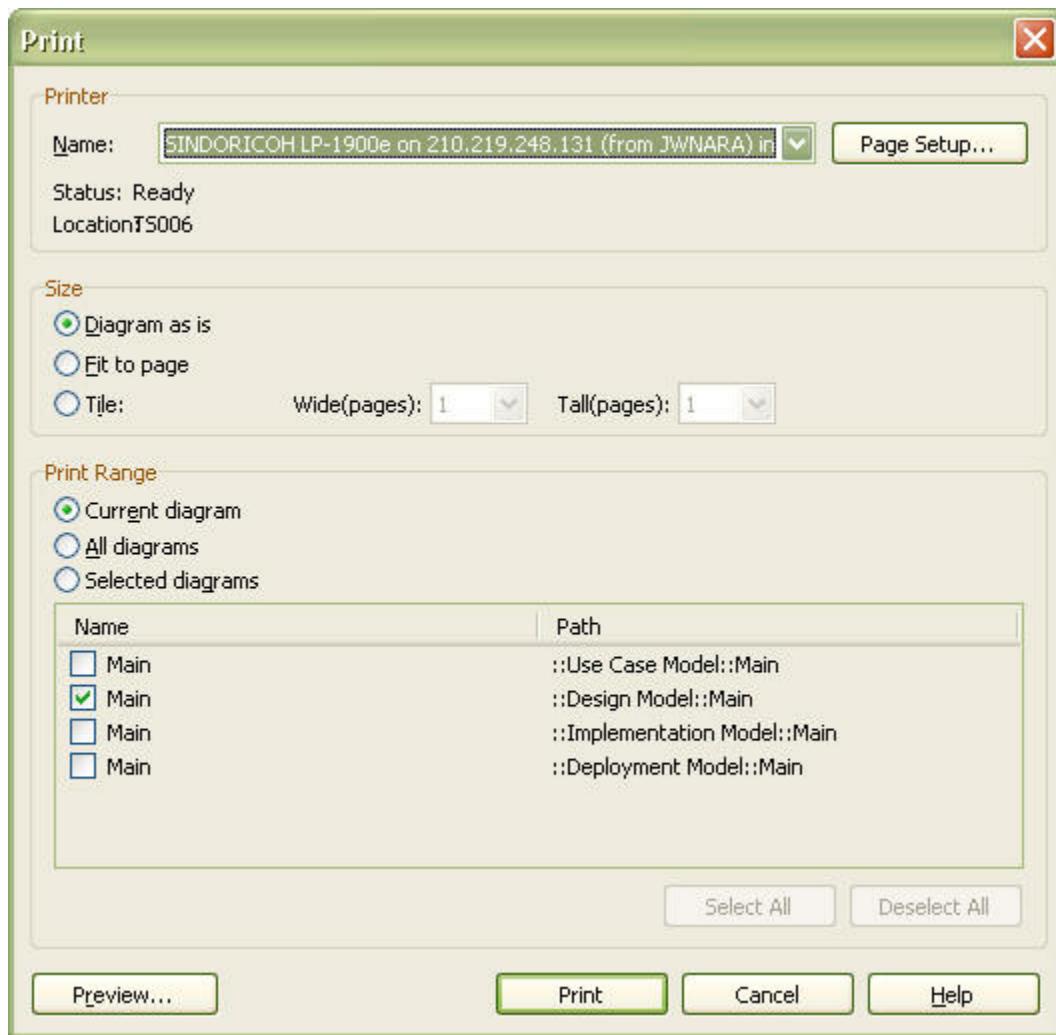
11

11 Printing Diagrams

Diagrams can be printed through various methods. This section describes the functions of selecting diagram to print, specifying diagram print size, printing diagram in multiple pages, etc.

Procedure for Printing the Current Diagram:

1. Select the **[File] -> [Print...]** menu to open the Print dialog box.



2. In the **[Printer]** group, enter the name of the printer to use in the **[Name]** field.
3. In the **[Print range]** group, select **[Current diagram]** and click the **[Print]** button.

Procedure for Printing Selected Diagrams Only:

1. Select the **[File] -> [Print...]** menu to open the Print dialog box.

- 2.In the **[Printer]** group, enter the name of the printer to use in the **[Name]** field.
- 3.In the **[Print range]** group, select **[Selected diagram(s)]** and check the diagrams to print in the **[Print range]** list below.
- 4.Click the **[Print]** button.

Procedure for Printing Diagram to Fit to Page:

- 1.Select the diagram(s) to print at the Print dialog box.
- 2.In the **[Size]** group, select **[Fit to page]** and click the **[Print]** button.

Procedure for Printing Diagram in Multiple Pages:

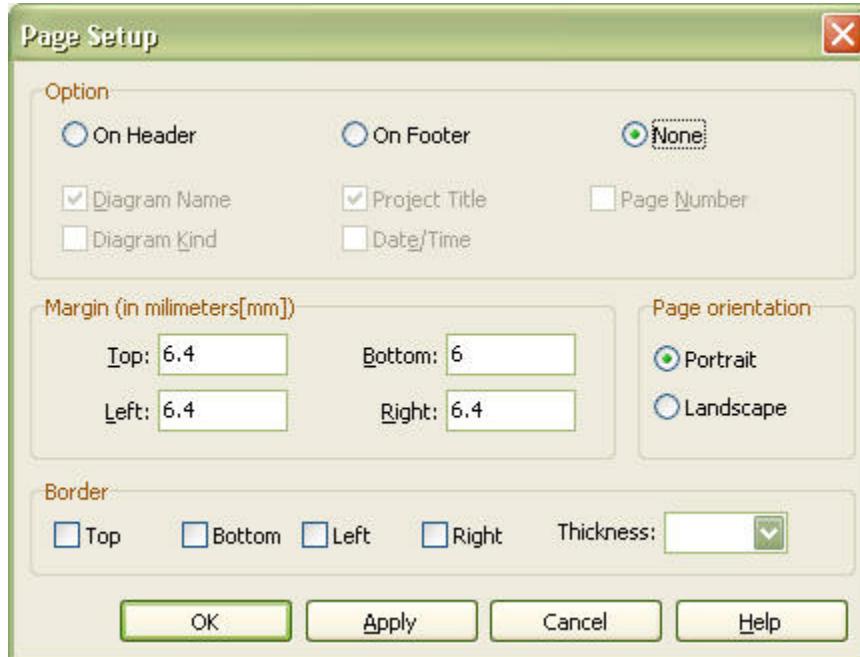
- 1.Select the diagram(s) to print at the Print dialog box.
- 2.In the **[Size]** group, select **[Tile]**. Then, enter integers in the **[page(s) wide]** and **[page(s) tall]** fields to specify how many pages will be used (e.g. select 3 pages wide and 2 pages tall to print on 6 pages, i.e., $3 \times 2 = 6$ pages).
- 3.Click the **[Print]** button.

11.1 Page Setup

Various properties (printing diagram information, page margins, printing outline, etc.) can be configured for the print page.

Procedure for Viewing Diagram Information:

- 1.Select the **[File] -> [Page Setup...]** menu to open the Page Setup dialog box.



2. First, choose where the diagram information will be printed. In the **[Options]** group, select **[None]** if the diagram information does not need to be printed. Select **[Header]** to print the diagram information at the top of the page, and select **[Footer]** to print it at the bottom of the page.
3. Select which information will be printed. Types of information available for printing include: **[Diagram name]**, **[Project name]**, **[Page number]**, **[Diagram type]** and **[Date/Time]**

Procedure for Setting Page Orientation:

1. Select the **[File] -> [Page Setup...]** menu to open the Page Setup dialog box.
2. In the **[Page orientation]** group, select **[Portrait]** to print the paper portrait, and **[Landscape]** to print it landscape.

Procedure for Specifying Page Margin:

1. Select the **[File] -> [Page Setup...]** menu to open the Page Setup dialog box.
2. In the **[Margins]** group, enter margin sizes in millimeters in the fields **[Top]**, **[Bottom]**, **[Left]**, and **[Right]**.

Procedure for Printing Page Outline:

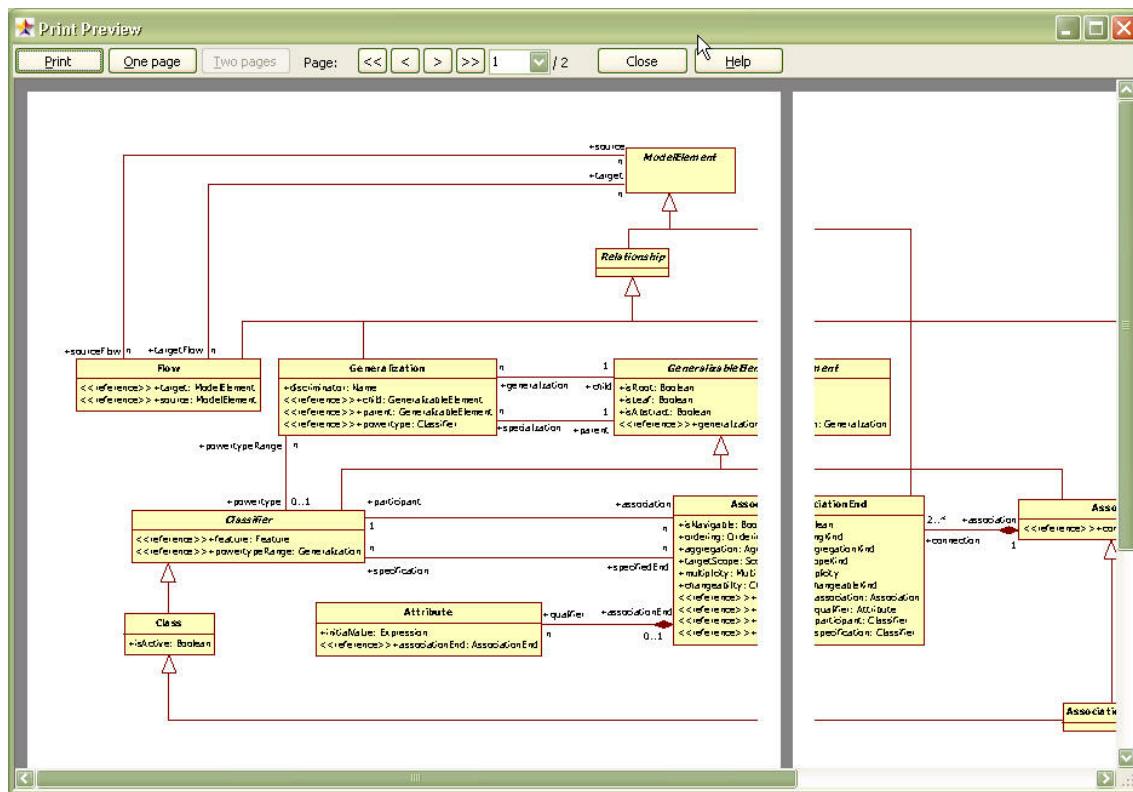
1. Select the **[File] -> [Page Setup...]** menu to open the Page Setup dialog box.
2. In the **[Border]** group, specify the sides for printing outline by checking **[Top]**, **[Bottom]**, **[Left]**, and **[Right]**.
3. Enter the border thickness in the **[Thickness]** field.

11.2 Print Preview

The print result can be previewed before actually printing it on paper.

Procedure for Previewing Print Result:

1. Select the **[File] -> [Print...]** menu to open the Print dialog box and enter the diagram information (see the "Printing Diagram" section).
2. Click the **[Preview...]** button at the bottom of the Print dialog box.
3. At the Print Preview dialog box, preview the print result by selecting to preview by one page or two pages.



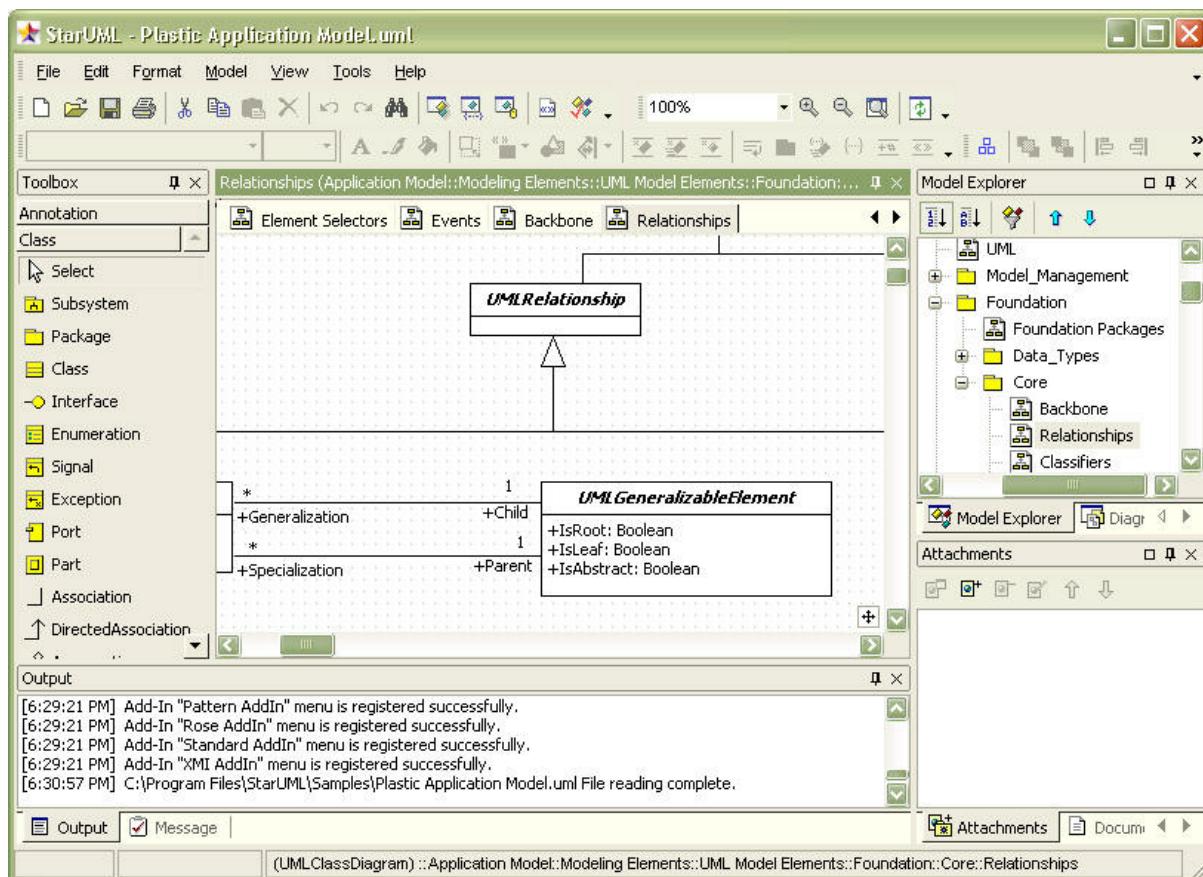
4. Click the **[Print]** button to print from this window, or click the **[Close]** button to close the preview window.

Chapter

12

12 User-Interface Reference

The WhiteStarUml Main window consists of the following components.



Main Menu

The main menu is at the top of the screen. Most of WhiteStarUml's functions are accessible through the main menu.

Toolbars

Toolbars are right below the main menu. They contain frequently used menu items.

Browser Area

The browser area is located in the upper left corner of the screen. This area contains the functions to facilitate easy exploring of the software project component elements. This area includes **[Model**

Explorer] which shows the model elements in hierarchical structures, and [**Diagram Explorer**] which shows the diagram types.

Inspector Area

The inspector area is located in the lower left corner of the screen. This area contains the functions to facilitate editing of the detailed information for elements. This area includes [**Property Editor**] which edits properties, [**Documentation Editor**] which records detailed descriptions, and [**Attachments Editor**] which attaches additional files or URLs.

Information Area

The information area is located in the lower right corner of the screen. This area contains the functions to show various types of information throughout the WhiteStarUml application. This area includes [**Output Window**] which shows log recordings, [**Messages Window**] which shows the model search and inspection results.

Diagram Area

The diagram area is located in the upper right corner of the screen. This area contains the functions to edit and manage the diagrams.

Pallet

Located on the left-hand side of the area is **Pallet**, which contains the elements that can be created.

12.1 Menus

This section describes in detail all of the menu items included in WhiteStarUml's main menu.

- File Menu
- Edit Menu
- Format Menu
- Model Menu
- View Menu
- Tools Menu
- Help Menu
- Shortcuts

File Menu

The File menu contains the following menu items.

Menu Item	Description
New Project[Ctrl+N]	Creates a new project.
New Project By Approach[Ctrl+I]	Opens the Select New Project dialog box.
Open[Ctrl+O]	Opens a project file.
Save[Ctrl+S]	Saves the project file.
Save As[Ctrl+A]	Saves the project as another file.
Close	Closes the current project.
Unit->Control Unit	Separates and saves the currently selected element as a unit.
Unit->Uncontrol Unit	Merges the currently selected unit element to the parent unit (or project).
Unit->Delete Unit	Deletes the currently selected unit element
Unit->Save Unit	Saves the currently selected unit as a file.
Unit->Save Unit As	Saves the currently selected unit as another file.
Import->Framework	Imports a framework into the current project.
Import->Model Fragment	Imports a model fragment into the current project.
Export->Model Fragment	Saves the currently selected element as a model fragment file.
Export Diagram[Shift+Ctrl+D]	Saves the currently active diagram as an image file.
Page Setup	Configures the page for printing
Print[Ctrl+P]	Prints the diagram.
Recent Files	Contains a list of the recently opened files.
Exit	Exits the program.

Edit Menu

The Edit menu contains the following menu items.

Menu Item	Description
Undo[Ctrl+Z]	Cancels the most recent action performed by the user.
Redo[Ctrl+Y]	Repeats the most recent action performed by the user.
Cut[Ctrl+X]	Copies the selected elements to clipboard and removes them from the current location.
Copy[Ctrl+C]	Copies the selected elements to clipboard.

Copy Diagram[Shift+Ctrl+C]	Copies the currently active diagram to clipboard.
Copy Diagram as Bitmap[Shift+Ctrl+C]	Copies the currently active diagram to clipboard as Bitmap.
Paste[Ctrl+V]	Pastes the clipboard contents into the currently selected element (or diagram).
Delete[Del]	Deletes the selected view elements in the diagram.
Delete From Model[Ctrl+Del]	Deletes the selected model elements.
Find[Ctrl+F]	Finds an element.
Select All[Ctrl+A]	Selects all the elements in the current diagram.

Format Menu

The Format menu contains the following menu items.

Menu Item	Description
Font	Specifies the font for the selected view elements.
Line Color	Specifies the line color for the selected view elements.
Fill Color	Specifies the fill color for the selected view elements.
Line Style->Rectilinear[Ctrl+L]	Specifies the line style of the selected connection view element as rectilinear.
Line Style->Oblique[Ctrl+B]	Specifies the line style of the selected connection view element as oblique.
Stereotype Display->None[Shift+Ctrl+N]	Shows nothing for the stereotype of the selected view elements.
Stereotype Display->Textual[Shift+Ctrl+T]	Shows the stereotype of the selected view elements with text.
Stereotype Display->Iconic[Shift+Ctrl+I]	Shows the stereotype of the selected view elements with icons.
Stereotype Display->Decoration [Shift+Ctrl+E]	Shows the stereotype of the selected view elements with decoration.
Suppress Attributes[Shift+Ctrl+A]	Suppresses the section that displays the attributes for the selected view elements (e.g. class, usecase, etc.).
Suppress Operations[Shift+Ctrl+O]	Suppresses the section that displays the operations for the selected view elements (e.g. class, subsystem, etc.).
Suppress Literals[Shift+Ctrl+L]	Suppresses the section that displays the attributes for the selected enumerations.
Word Wrap Name	Shows the Word Wrap of the selected view elements.
Show Parent Name	Shows the parent name of the selected view elements.

 Show Operation Signature	Shows the operation signature of the selected view elements (e.g. class, subsystem, etc.).
 Show Properties	Shows the property items (e.g. tagged values, changeability attribute, etc.) included in view elements.
 Show Compartment Visibility	Shows the visibility of the compartments of the selected view elements (e.g. attribute compartment, operation compartment, etc.).
 Show Compartment Stereotype	Shows the stereotypes of the compartments of the selected view elements (e.g. attribute compartment, operation compartment, etc.).
 Auto Resize	Automatically resizes the selected view elements.
Alignment->  Bring to Front	Brings the selected elements to front.
Alignment->  Send to Back	Sends the selected elements to back.
Alignment->  Align Left	Aligns the selected elements to left.
Alignment->  Align Right	Aligns the selected elements to right.
Alignment->  Align Middle	Centers the selected elements horizontally.
Alignment->  Align Top	Aligns the selected elements to top.
Alignment->  Align Bottom	Aligns the selected elements to bottom.
Alignment->  Align Center	Centers the selected elements vertically.
Alignment->  Space Equally, Horizontally	Evenly distributes the selected elements horizontally.
Alignment->  Space Equally, Vertically	Evenly distributes the selected elements vertically.
 Layout Diagram	Lays out the view elements in the current diagram.

Model Menu

The Model menu contains the following menu items.

Menu Item	Description
Add->...	Adds a model element. The model elements that can be added under the currently selected model elements are displayed in the sub menu.
Add Diagram->...	Adds a diagram. The diagrams that can be added under the currently selected model elements are displayed in the sub menu.
 Collection Editor[Ctrl+F5]	Opens the collection editor that can be used to edit the child elements of the currently selected model element.

 Constraints[Ctrl+F6]	Opens the constraint editor that can be used to edit the constraints of the currently selected model element.
 TaggedValues[Ctrl+F7]	Opens the tagged value editor that can be used to edit the tagged values of the currently selected model element.
 Profiles[Ctrl+F8]	Opens the profile manager.
 Verify Model[F9]	Opens the Verify Model dialog box that can be used to inspect the model elements in the current project.
Convert Diagram->Convert Sequence(Role) to Collaboration(Role)	Generates a new diagram by converting the currently selected sequence (role) diagram into a collaboration (role) diagram (default Add-In function).
Convert Diagram->Convert Collaboration(Role) to Sequence(Role)	Generates a new diagram by converting the currently selected collaboration (role) diagram into a sequence (role) diagram (default Add-In function).

View Menu

The View menu contains the following menu items.

Menu Item	Description
Close Diagram	Closes the currently active diagram.
Close All Diagrams	Closes all open diagrams.
Select In Model Explorer	Shows the currently selected element in the model explorer.
 Refresh	Refreshes the current diagram.
Model Explorer	Toggles the Model Explorer on and off.
Diagram Explorer	Toggles the Diagram Explorer on and off
Properties	Toggles the Properties Editor on and off.
Documentations	Toggles the Documentation Editor on and off.
Attachments	Toggles the Attachments Editor on and off.
Output	Toggles the Output Window on and off.
Messages	Toggles the Message Window on and off.
Toolbox	Toggles the Toolbox on and off.
Zoom->  Zoom In	Makes the diagram look larger.
Zoom->  Zoom Out	Makes the diagram look smaller.

Zoom->  Fit To Window	Automatically adjusts the zoom ratio to fit the whole diagram in the window.
Zoom->50%	Shows the current diagram at 50% zoom ratio.
Zoom->75%	Shows the current diagram at 75% zoom ratio.
Zoom->100%	Shows the current diagram at 100% zoom ratio.
Zoom->125%	Shows the current diagram at 125% zoom ratio.
Zoom->150%	Shows the current diagram at 150% zoom ratio.
Zoom->175%	Shows the current diagram at 175% zoom ratio.
Zoom->200%	Shows the current diagram at 200% zoom ratio.
Toolbars->Standard	Toggles the Standard toolbar on and off.
Toolbars->Format	Toggles the Format toolbar on and off.
Toolbars->View	Toggles the View toolbar on and off.
Toolbars->Alignment	Toggles the Align toolbar on and off.

Tools Menu

The Tools menu contains the following menu items.

Menu Item	Description
Options...	Opens the Options dialog box that can be used to edit various environment configuration options.
Add-In Manager...	Opens the Add-In Manager that can be used to manage the additionally installed Add-In programs.

Help Menu

The Help menu contains the following menu items.

Menu Item	Description
 Contents...[F1]	Opens the WhiteStarUML help.
WhiteStarUML On the Web	Moves to the WhiteStarUML website.
About	Shows the WhiteStarUML information.

12.2 Shortcut Keys

WhiteStarUML provides shortcuts to menu functions. The shortcuts can increase efficiency and convenience in software modeling.

Shortcut Key	Menu Item
Del	Delete
F1	WhiteStarUml Help
F5	Refresh
F6	Browser Window
F7	Inspector Window
F8	Information Window
F9	Verify Model
Ctrl+F4	Close Diagram
Ctrl+F5	Collection Editor
Ctrl+F6	Constraint Editor
Ctrl+F7	Tagged Values
Ctrl+A	Select All
Ctrl+B	Oblique
Ctrl+C	Copy
Ctrl+F	Find
Ctrl+I	Select New Project
Ctrl+L	Rectilinear
Ctrl+M	Show in Model Explorer
Ctrl+N	New Project
Ctrl+O	Open
Ctrl+P	Print
Ctrl+S	Save
Ctrl+V	Paste
Ctrl+X	Cut
Ctrl+Y	Redo
Ctrl+Z	Undo
Ctrl+Del	Delete Model
Shift+Ctrl+F4	Close All Diagrams
Shift+Ctrl+A	Suppress Attributes
Shift+Ctrl+C	Copy Diagram
Shift+Ctrl+D	Export Diagram
Shift+Ctrl+E	Decoration(Stereotype Display)
Shift+Ctrl+I	Icon (Stereotype Display)
Shift+Ctrl+L	Suppress Literals
Shift+Ctrl+N	None (Stereotype Display)
Shift+Ctrl+O	Suppress Operations
Shift+Ctrl+S	Save As
Shift+Ctrl+T	Text (Stereotype Display)

12.3 Toolbars

This section describes in detail all of the toolbar items in WhiteStarUml.

- Standard Toolbar
- Format Toolbar
- View Toolbar
- Align Toolbar
- Pallet Toolbar

Standard Toolbar

The Standard toolbar contains the following functions.

Toolbar	Description
New Project[Ctrl+N]	Creates a new project.
Open[Ctrl+O]	Opens a project file.
Save[Ctrl+S]	Saves the project file
Print[Ctrl+P]	Prints the diagram.
Cut[Ctrl+X]	Copies the selected elements to clipboard and removes them from the current location.
Copy[Ctrl+C]	Copies the selected elements to clipboard.
Paste[Ctrl+V]	Pastes the clipboard contents into the currently selected element (or diagram).
Delete[Del]	Deletes the selected view elements in the diagram.
Undo[Ctrl+Z]	Cancels the most recent action performed by the user.
Redo[Ctrl+Y]	Repeats the most recent action performed by the user.
Find[Ctrl+F]	Finds an element.
Collection Editor[Ctrl+F5]	Opens the collection editor that can be used to edit the child elements of the currently selected model element.
Constraints[Ctrl+F6]	Opens the constraint editor that can be used to edit the constraints of the currently selected model element.
TaggedValues[Ctrl+F7]	Opens the tagged value editor that can be used to edit the tag definitions of the currently selected model element.
Profiles[Ctrl+F8]	Opens the profile manager.

 Verify Model[F9]	Opens the Verify Model dialog box that can be used to inspect the model elements in the current project.
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Format Toolbar

The Format toolbar contains the following functions.

Tool	Description
(Combo) Font Name	Specifies the font name for the selected view elements.
(Combo) Font Size	Specifies the font size for the selected view elements.
 Font...	Specifies the font for the selected view elements.
 Line Color...	Specifies the line color for the selected view elements.
 Fill Color...	Specifies the fill color for the selected view elements.
 Auto Resize	Automatically resizes the selected view elements.
 Stereotype Display	Specifies how the stereotypes will be shown for the selected view elements.
 Show As Extended Notation	Specifies how the extended notation will be shown for the selected view elements.
 Line Style	Specifies the line style for the selected connection view elements.
 Suppress Attributes[Shift+Ctrl+A]	Suppresses the section that displays the attributes for the selected view elements (e.g. class, usecase, etc.).
 Suppress Operations[Shift+Ctrl+O]	Suppresses the section that displays the operations for the selected view elements (e.g. class, subsystem, etc.).
 Suppress Literals[Shift+Ctrl+L]	Suppresses the section that displays the attributes for the selected enumerations.
 Word Wrap Name	Shows the word wrap of the selected view elements.
 Show Parent Name	Shows the parent name of the selected view elements.
 Show Operation Signature	Shows the operation signature of the selected view elements (e.g. class, subsystem, etc.).
 Show Properties	Shows the property items (e.g. tagged values, changeability attribute, etc.) included in view elements.
 Show Compartment Visibility	Shows the visibility of the compartments of the selected view elements (e.g. attribute compartment, operation compartment, etc.).

Show Compartment Stereotype	Shows the stereotype of the compartments of the selected view elements (e.g. attribute compartment, operation compartment, etc.).
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View Toolbar

The View toolbar contains the following functions.

Tool	Description
(Combo) Zoom	Selects the zoom ratio for the current diagram.
Zoom In	Makes the diagram look larger.
Zoom Out	Makes the diagram look smaller.
Fit To Window	Automatically adjusts the zoom ratio to fit the whole diagram in the window.
Refresh[F5]	Refreshes the current diagram.

Align Toolbar

The Align toolbar contains the following functions.

Tool	Description
Layout Diagram	Lays out the view elements in the current diagram.
Bring to Front	Brings the selected elements to front.
Send to Back	Sends the selected elements to back.
Align Left	Aligns the selected elements to left.
Align Right	Aligns the selected elements to right.
Align Middle	Centers the selected elements horizontally.

 Align Top	Aligns the selected elements to top.
 Align Bottom	Aligns the selected elements to bottom.
 Align Center	Centers the selected elements vertically.
 Space Equally, Horizontally	Evenly distributes the selected elements horizontally.
 Space Equally, Vertically	Evenly distributes the selected elements vertically.

Pallet Toolbar

The Pallet toolbar contains the following functions for selecting and creating elements in the diagram.

Common Pallet Tool

The following functions are always available in the Pallet toolbar regardless of the diagram types.

Tool	Description
 Select	The most basic tool that selects, moves or resizes an element in the diagram.
 Note	Creates a note element in the current diagram.
 Note Link	Links a note in the current diagram to another element.
 Text	Creates a string element in the current diagram.
 Rectangle	Create a figure of rectangle in the current diagram.
 Ellipse	Creates a figure of ellipse in the current diagram.
 Rounded Rectangle	Creates a figure of rounded rectangle in the current diagram.

Pallet Tool by Diagram Types

The following functions create elements by diagram types.

Tool	Description	Diagram
 Select	The most basic tool that selects, moves or resizes an element in the diagram.	All diagrams

 Subsystem	Creates a subsystem element in the current diagram.	Class Diagram
 Package	Creates a package element in the current diagram..	Class Diagram, Component Diagram, Deployment Diagram, UseCase Diagram
 Class	Creates a class element in the current diagram.	Class Diagram, Composite Diagram
 Interface	Creates an interface element in the current diagram.	Class Diagram, Component Diagram, Composite Diagram
 Enumeration	Creates an enumeration element in the current diagram.	Class Diagram
 Signal	Creates a signal element in the current diagram.	Class Diagram
 Except	Creates an exception element in the current diagram.	Class Diagram
 Component	Creates a component element in the current diagram.	Component Diagram
 ComponentInstance	Creates a component instance element in the current diagram.	Component Diagram
 Node	Creates a node element in the current diagram.	Deployment Diagram
 NodeInstance	Creates a node instance element in the current diagram.	Component Diagram, Deployment Diagram
 Artifact	Creates a artifact in the current diagram.	UseCase Diagram
 UseCase	Creates a usecase element in the current diagram.	UseCase Diagram
 Actor	Creates an actor element in the current diagram.	UseCase Diagram
 SystemBoundary	Creates an system boundary in the current diagram.	UseCase Diagram
 Object	Creates an object element in the current diagram.	Class Diagram, Sequence Diagram, Collaboration Diagram

 Part	Creates a Part element with a Classifier in the current diagram.	Class Diagram, Component Diagram, Deployment Diagram, Composite Diagram
 Port	Creates a Port element with a Classifier in the current diagram.	Class Diagram, Component Diagram, Deployment Diagram, Composite Diagram
 ClassifierRole	Creates a ClassifierRole element in the current diagram.	Sequence Role Diagram, Collaboration Role Diagram
 Combined Fragment	Creates a Combined Fragment element in the current diagram.	Sequence Diagram, Sequence Role Diagram, Collaboration Diagram, Collaboration Role Diagram
 Interaction Operand	Creates a Interaction Operand element with a Combined Fragment in the current diagram.	Sequence Diagram, Sequence Role Diagram, Collaboration Diagram, Collaboration Role Diagram
 Frame	Creates a Frame element in the current diagram	Sequence Diagram, Sequence Role Diagram, Collaboration Diagram, Collaboration Role Diagram
 CompositeState	Creates a CompositeState element in the current diagram.	Statechart Diagram
 SubmachineState	Creates a SubmachineState element in the current diagram.	Statechart Diagram
 InitialState	Creates an InitialState (Pseudostate) element in the current diagram.	Statechart Diagram, Activity Diagram
 FinalState	Creates a FinalState element in the current diagram.	Statechart Diagram, Activity Diagram
 Flow Final	Creates a DeepHistory(FlowFinalState) element in the current diagram.	Statechart Diagram, Activity Diagram
 ChoicePoint	Creates a Choice (Pseudostate) element in the current diagram.	Statechart Diagram
 JunctionPoint	Creates a Junction (Pseudostate) element in the current diagram.	Statechart Diagram

 ShallowHistory	Creates a ShallowHistory (Pseudostate) element in the current diagram.	Statechart Diagram
 DeepHistory	Creates a DeepHistory (Pseudostate) element in the current diagram.	Statechart Diagram
 Synchronization	Creates a Synchronization (Pseudostate) element in the current diagram.	Statechart Diagram, Activity Diagram
 ActionState	Creates an ActionState element in the current diagram.	Activity Diagram
 SubactivityState	Creates a Subactivity State element in the current diagram.	Activity Diagram
 Decision	Creates a Decision (Pseudostate) element in the current diagram.	Activity Diagram
 ObjectFlow	Creates a ObjectFlowState element in the current diagram.	Activity Diagram
 Signal Accept State	Creates a SignalAcceptState element in the current diagram.	Activity Diagram
 Signal Send State	Creates a SignalSendState element in the current diagram.	Activity Diagram
 Swimlane (Vertical)	Creates a Swimlane by vertical solid lines in the current diagram.	Activity Diagram
 Swimlane (Horizontal)	Creates a Swimlane by horizontal solid lines in the current diagram.	Activity Diagram
 Association	Links a semantic association between two classes in the current diagram.	Class Diagram, Component Diagram, Deployment Diagram, UseCase Diagram
 DirectedAssociation	Links a semantic association between two classes in the current diagram.	Class Diagram, Deployment Diagram, UseCase Diagram
 Aggregation	Links a semantic association between two classes in the current diagram.	Class Diagram
 Composition	Links a semantic association between two classes in the current diagram.	Class Diagram

 Generalization	Links a generalized element and a specialized element with a generalization relation in the current diagram.	Class Diagram, UseCase Diagram
 Dependency	Links two elements with a dependency relation in the current diagram.	Class Diagram, Component Diagram, Deployment Diagram, UseCase Diagram, Composite Diagram
 Realization	Links a specification element and its implementation element with a realization relation in the current diagram.	Class Diagram, Component Diagram, Composite Diagram
 AssociationClass	Links a class and an association in the current diagram so that the association itself can have the significance of a class.	Class Diagram
 Include	Links two UseCases with an Include relation in the current diagram so that one UseCase includes the other UseCase behaviors.	UseCase Diagram
 Extend	Links two UseCases with an Extend relation in the current diagram so that one UseCase can be extended with the behaviors defined in the other UseCase.	UseCase Diagram
 AssociationRole	Links two roles with an AssociationRole in the current diagram.	Collaboration Role Diagram
 SelfAssociationRole	Creates an AssociationRole from one role to the same role in the current diagram.	Collaboration Role Diagram
 Link	Links two objects in the current diagram.	Class Diagram, Collaboration Diagram
 SelfLink	Links an object with itself in the current diagram.	Class Diagram, Collaboration Diagram
 ForwardMessage	Defines a message between two roles in the current diagram.	Sequence Role Diagram, Collaboration Role Diagram
 ReverseMessage	Defines a message between two roles in the current diagram.	Sequence Role Diagram, Collaboration Role Diagram
 SelfMessage	Creates a message from a role to the same role in the current diagram.	Sequence Role Diagram, Collaboration Role Diagram

 ForwardStimulus	Defines a stimulus between two objects in the current diagram.	Sequence Diagram, Collaboration Diagram
 ReverseStimulus	Defines a stimulus between two objects in the current diagram.	Sequence Diagram, Collaboration Diagram
 SelfStimulus	Creates a stimulus from an object to the same object in the current diagram.	Sequence Diagram, Collaboration Diagram
 Transition	Links a source state and a target state with a transition in the current diagram.	Statechart Diagram, Activity Diagram
 SelfTransition	Links an original state and a target state with a transition in the current diagram.	Statechart Diagram, Activity Diagram
 Connector	Links a original feature and a target feature with a connector in the current diagram.	Class Diagram, Component Diagram, Deployment Diagram, Composite Diagram

12.4 Viewers

Model Explorer

The Model Explorer supports the user to effectively manage and explore the model elements by showing them in hierarchical structures. Select the **[Model Explorer]** tab in the **[Browser]** area to open the Model Explorer.

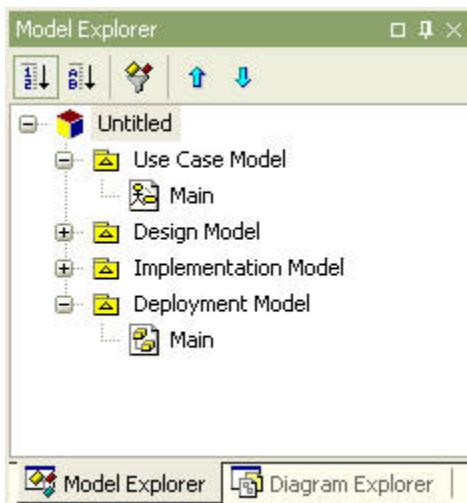
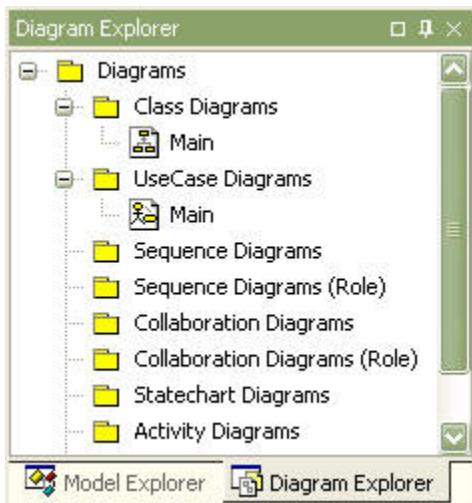


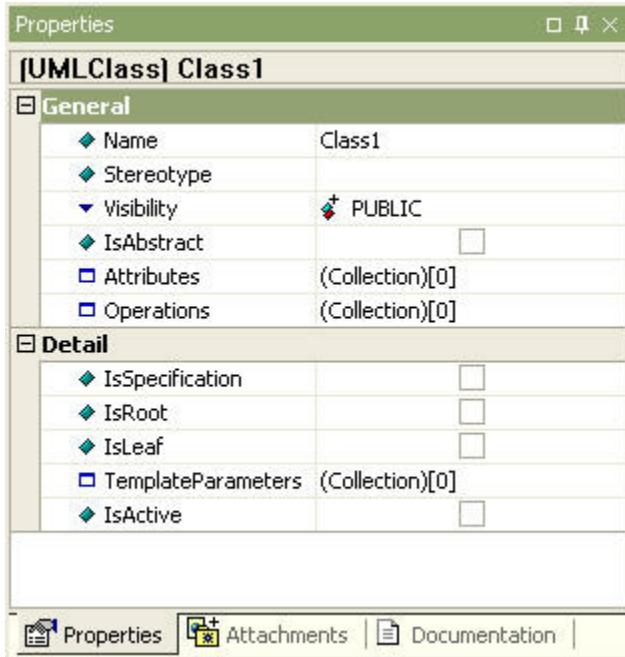
Diagram Explorer

The Diagram Explorer supports the user to effectively manage and explore the diagrams by listing them by their types. Select the **[Diagram Explorer]** tab in the **[Browser]** area to open the Diagram Explorer.



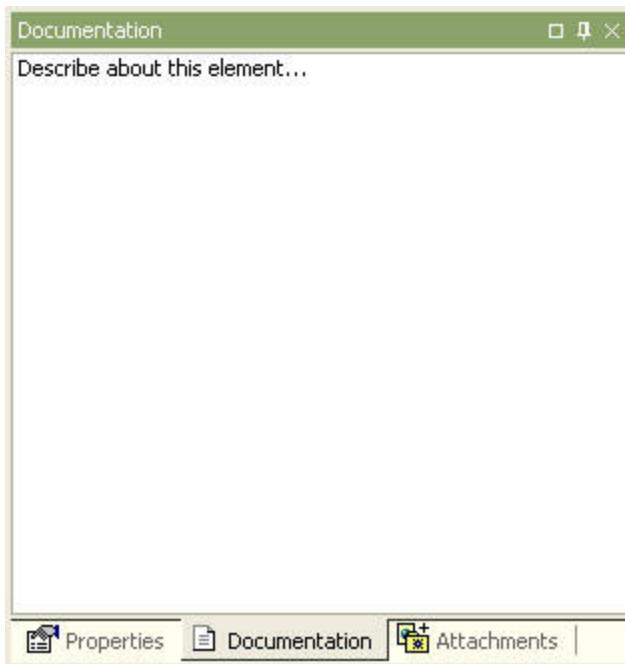
Property Editor

The Property Editor is used for editing the detailed properties of the currently selected model element. Select the **[Properties]** tab in the **[Inspector]** area to open the Property Editor.



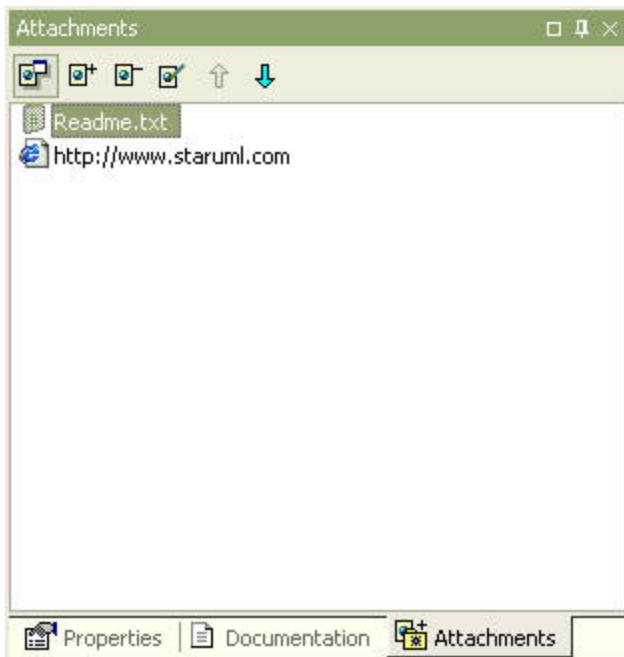
Documentation Editor

The Documentation Editor is used for recording additional descriptions of the currently selected element. Select the **[Documentation]** tab in the **[Inspector]** area to open the Documentation Editor.



Attachments Editor

The Attachments Editor allows the user to attach files or web URLs to a specific element. Select the **[Attachments]** tab in the **[Inspector]** area to open the Attachments Editor.



Attachment List

Shows a list of the files or URLs attached to the element.

Open Button

Opens the selected attachment file or URL with the associated program. For example, if a .doc file is selected, it is automatically opened in Microsoft Word, and if a web address such as http://www.staruml.com is selected, it is opened in the web browser.

Add Button

Attaches a new file or URL. Click this button to open the Attachment Item dialog box.

Remove Button

Removes the selected item from the attachment list.

Edit Button

Edits the selected item from the attachment list. The Attachment Item Editor can be used to change the file name or enter another URL.

Move Up Button

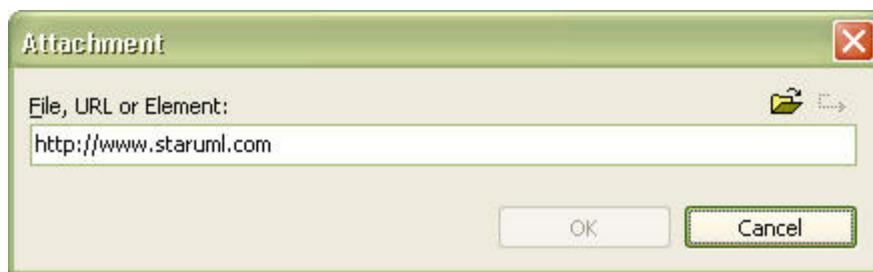
Moves the selected item up in the attachment list.

Move Down Button

Moves the selected item down in the attachment list.

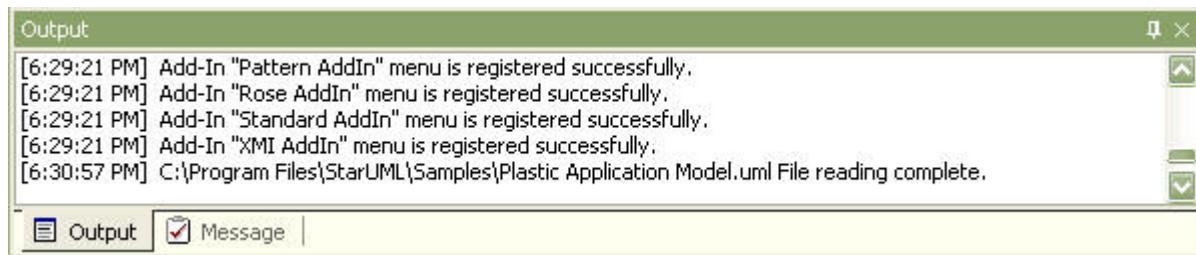
Attachment Item Dialog Box

Edits the attachment item name. Enter a URL or pathname for a file. The button on the right can be used to select a file.



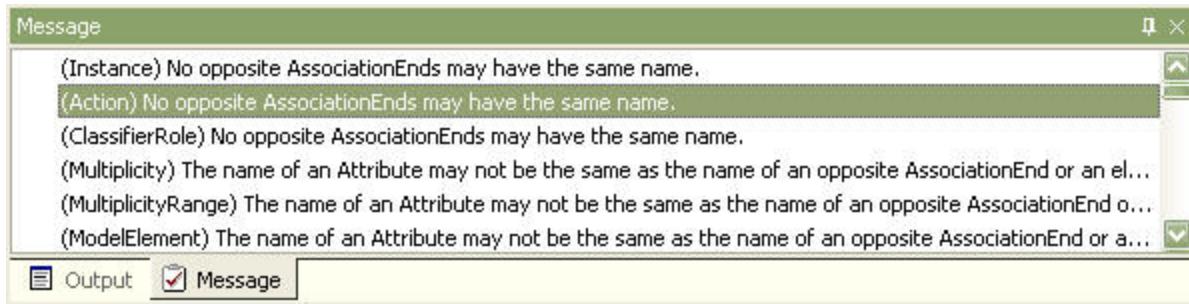
Output Window

The Output Window keeps and shows a record of the events in WhiteStarUML. Select the [**Output**] tab in the [**Information**] area to open the Output Window.



Messages Window

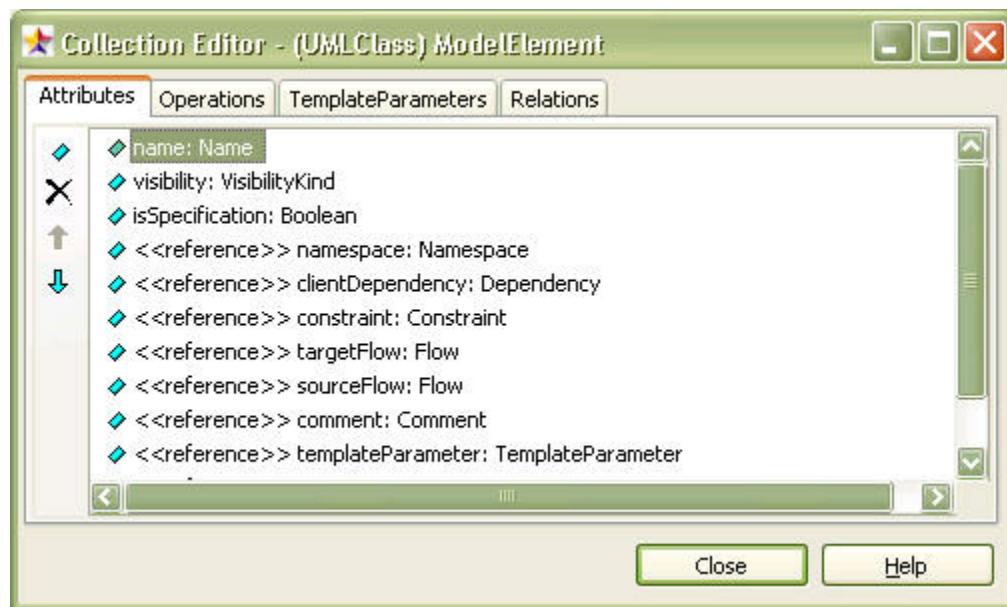
The Message Window shows the results of element search or software model inspection. Select the [**Messages**] tab in the [**Information**] area to open the Message Window.



12.5 Dialogs

Collection Editor

The Collection Editor is used for managing a list of child elements for a specific element.



Tab

Shows collections (a list of child elements contained in the current element) contained in the element by tabs. Different types of elements have different collections, and therefore have different tabs. For example, Class element has tabs for Attributes and Operations. The Relations tab is always present regardless of the element type.

Collection Element List

Shows a list of the child elements. Select an element here and edit it using the property editor,

documentation editor, and attachment editor in the inspector area. For showing element stereotype, visibility/stereotype, etc., please refer to the section on General Configurations, in Environment Configurations.

Add Button

Creates a new element and adds it to the list. This button may connect existing elements instead of creating a new element (e.g. Residents, DeployedComponents, RaisedSignals).

Delete Button

Deletes the selected element in the collection element list. This button may remove the element from the list instead of deleting it (e.g. Residents, DeployedComponents, RaisedSignals).

Move Up Button

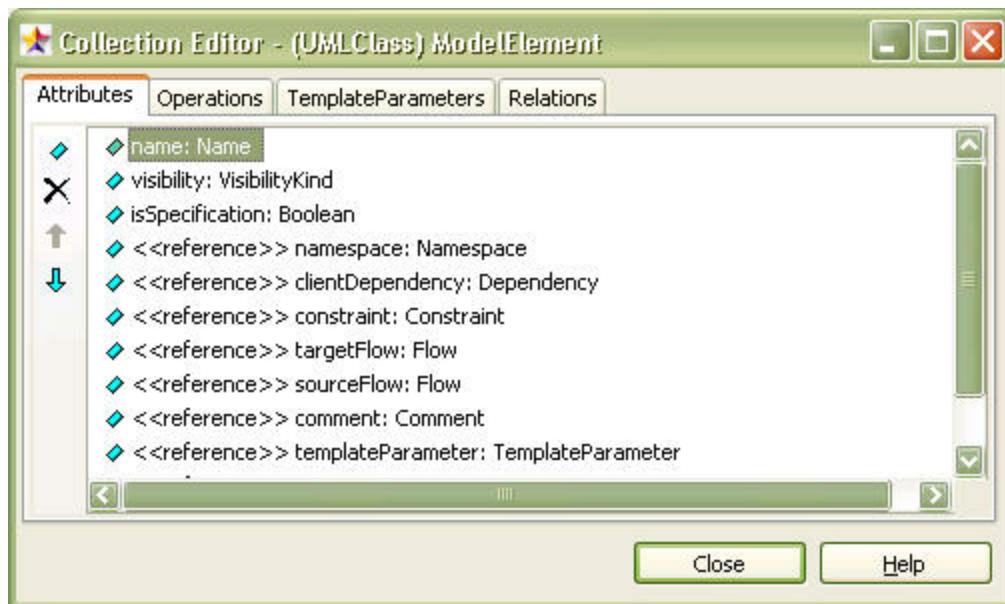
Moves the selected element up in the collection element list.

Move Down Button

Moves the selected element down in the collection element list.

Constraint Editor

The Constraint Editor is used for managing the constraints for elements.



Constraints

Shows the names and contents of the constraints for elements.

Add

Adds a new constraint to the element. This button opens the Constraints dialog box.

Delete

Deletes the selected constraint in the constraints list.

Edit

Edits the selected constraint in the constraints list.

Move Up

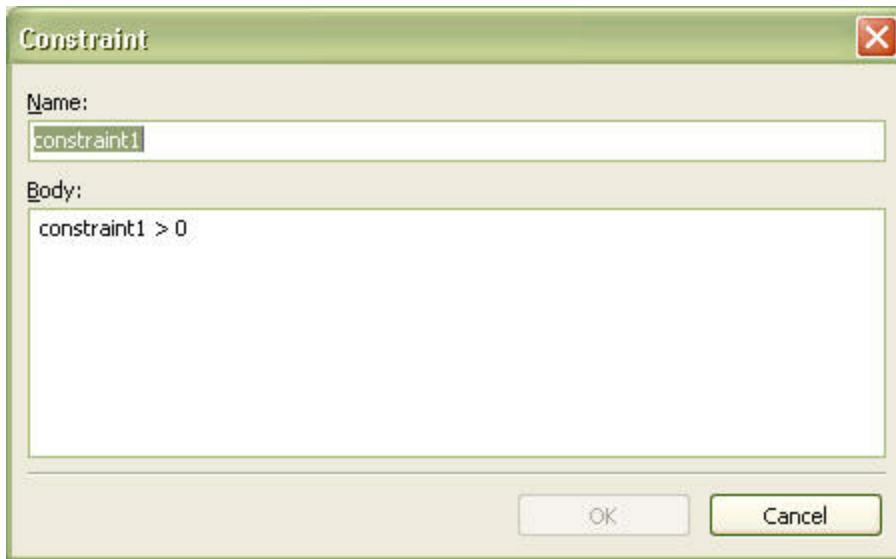
Moves the selected constraint up in the constraints list.

Move Down

Moves the selected constraint down in the constraints list.

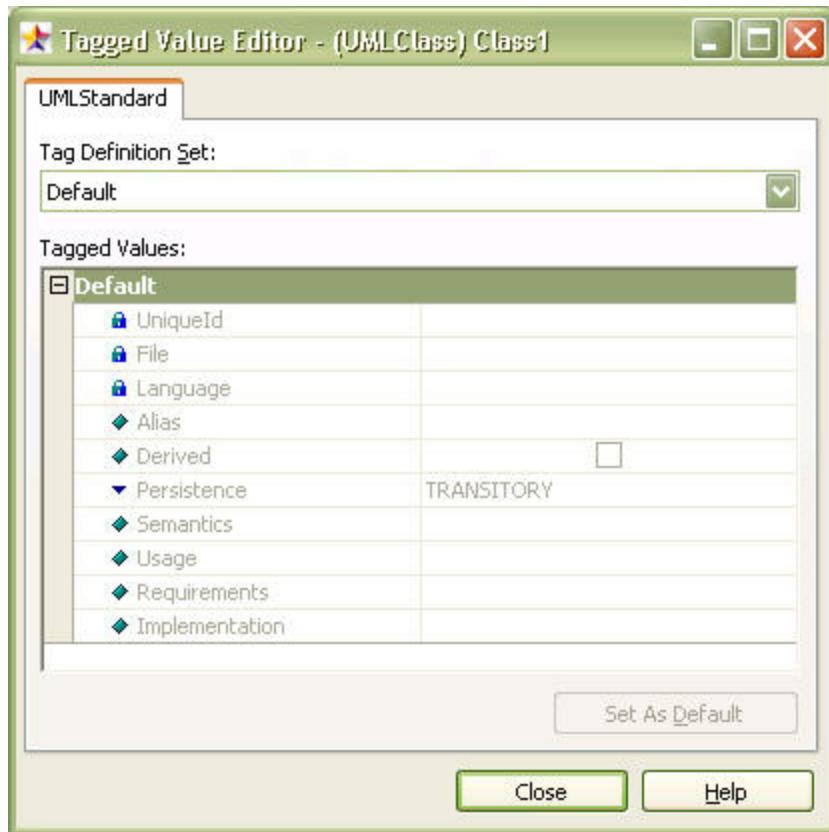
Constraint Dialog Box

This is used for adding a new constraint or editing the name and/or contents of existing constraints in the Constraint Editor. Enter the name of the constraint in the **[Name]** field and enter the contents of the constraint in the **[Expression]** field. The user may freely enter any contents or write in the UML OCL (Object Constraint Language).



Tagged Value Editor

The Tagged Value Editor is used for editing the tagged values that can be added to specific elements.



Profile Tab

By default, tagged values are defined in profiles. If there is a profile that contains the tagged values which can be applied to the currently selected element, it is shown as a tab. The tag definitions defined in the profile are displayed in the **[Tag Definition Set]** and **[Tagged Values]** fields.

Tag Definition Set

Shows the tag definition set that can be applied to the currently selected element. The tagged values included in this set are displayed in the **[Tagged Values]** field.

Tagged Values

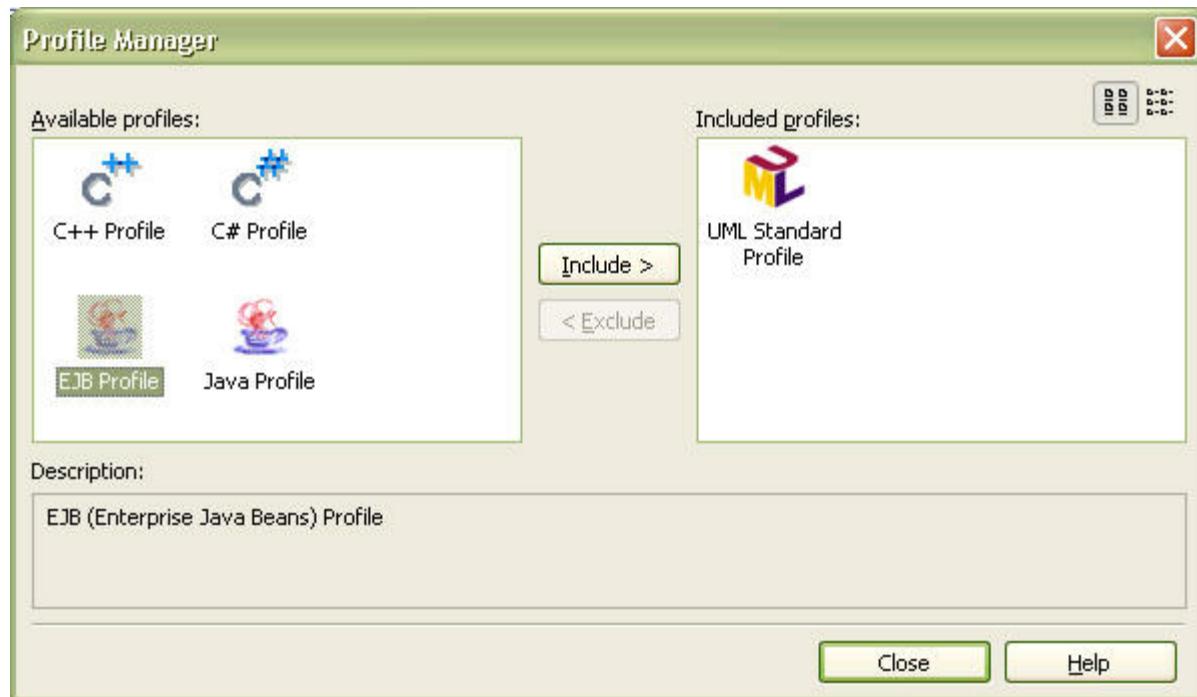
Lists the definitions and their values included in the tag definition set selected in **[Tag Definition Set]**. The user may directly change the values.

Set As Default

Every tag definition has a default value. Select a tag definition in **[Tagged Values]** and click this button to clear the changed value and set it back to the default value.

Profile Manager

The Profile Manager can be used for including or excluding the UML profiles for the current project.



Available profiles

Shows a list of the UML profiles registered for use in WhiteStarUml. Profiles currently in use by the current project are not shown here.

Include profiles

Shows a list of the UML profiles in use by the current project.

Large Icon/Small Icon Button

Toggles the profile list icon size between large and small. Select the Small Icon Button if the profile names are only partially shown and difficult to read.

Include

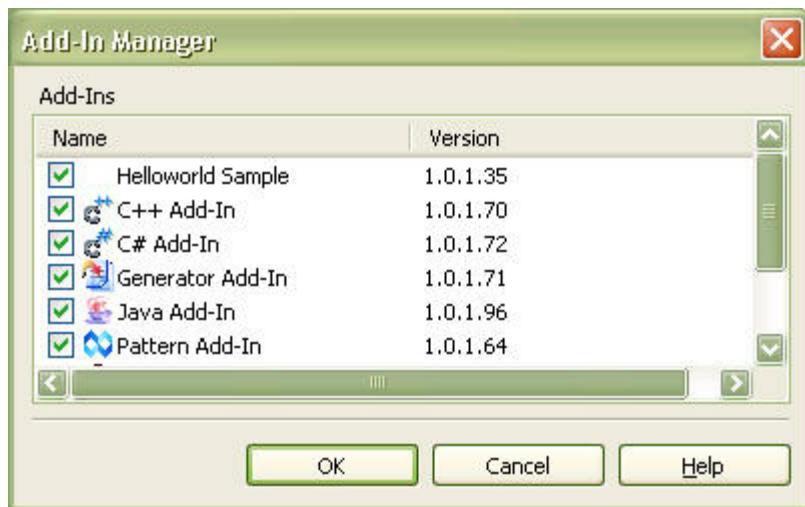
Includes the profile selected in the available profile list for use by the current project.

Exclude

Excludes the profile selected in the included profile list so that it is no longer used by the current project.

Add-In Manager

The Add-In Manager can be used to view a list of the installed Add-Ins and to enable or disable the Add-Ins.



Add-Ins List

Shows a list of the installed Add-Ins. The user can check or uncheck each item to enable or disable the respective Add-In.

Note

- The list of Add-Ins in the Add-In Manager window may vary according to the user's installation environment.

Select New Project Dialog Box

The Select New Project dialog box provides various selection methods when creating a new project. The New Project dialog box consists of three pages: Select Approach, Open Existing File, and Open Recent File.

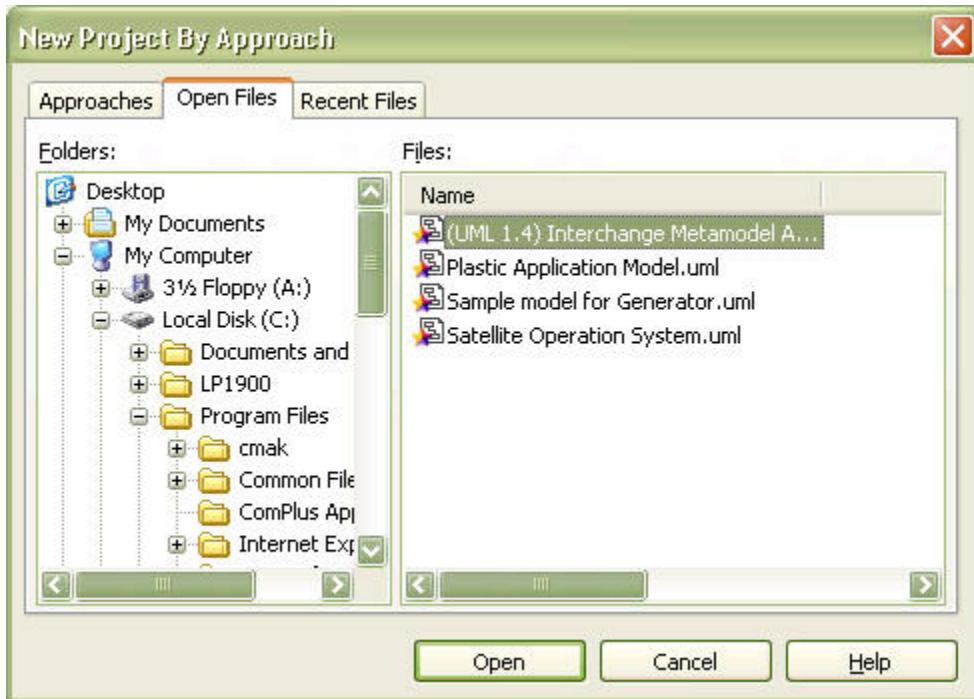
Approaches

The user can apply a specific approach for creating a new project.



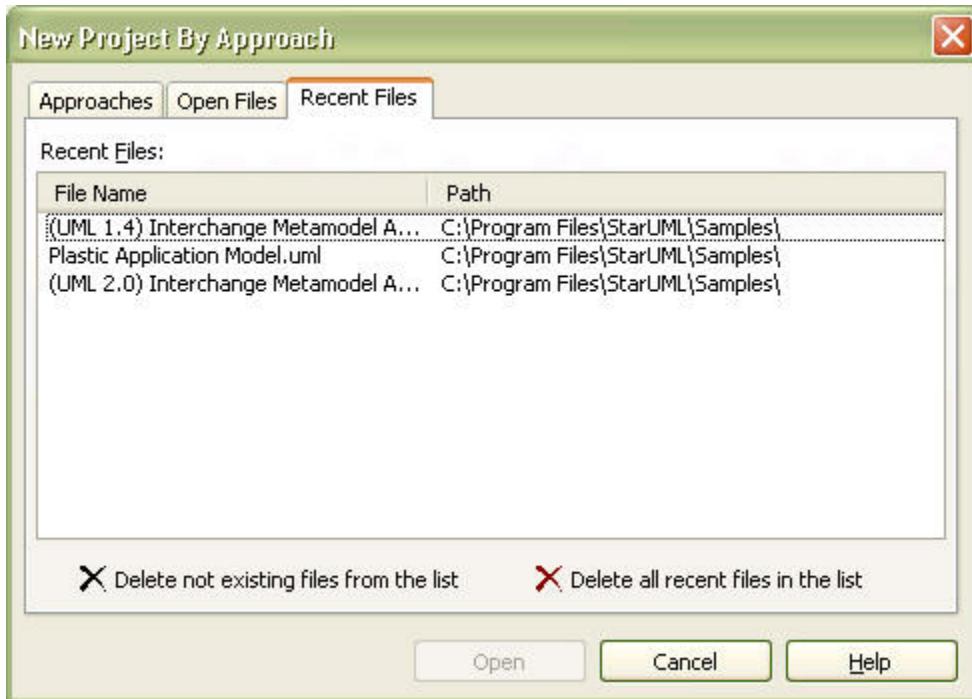
- **Approaches:** The approaches list displays the names and icons of the registered approaches. Select the "Empty Project" item if no approach is needed.
- **Large Icon/Small Icon Button:** This toggles the icon size for the approach list. Select the small icon button if the approach names are shortened and difficult to read.
- Description: This area shows a brief description of the approach item selected from the list.
- **Use the selected Approach by default :** Select an approach from the list and check this check box to set the approach as the default approach. The default approach is applied when creating a new project by selecting the [File] -> [New] -> [New Project] menu.

Open Files



The user can open a previously created file. The tree view on the left shows the user system's folder structure, and the file list area on the right shows the project files in the selected folder. Select a file from this file list and click the **[Open]** button to open the selected file.

Recent Files

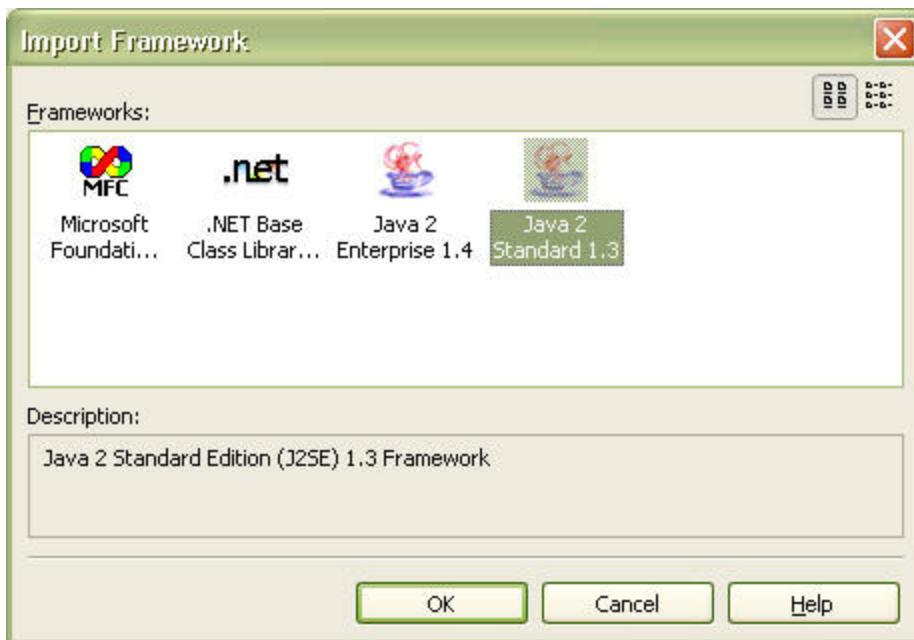


The user can see a list of the recently edited files and open them.

- **Recently modified files:** Shows a list of the recently edited files.
- **Remove non-existent files from the list:** Checks for files that no longer exist and removes them from the recent files list.
- **Clear the recent files list:** Clears all the files in the recent file list. The recent file list in the system registry is deleted.

Import Framework Dialog Box

The Import Framework dialog box allows the user to select an available framework and load it to the current project.



Frameworks list

The frameworks list displays the names and icons of the registered frameworks. Select a framework to load.

Large Icon/Small Icon Button

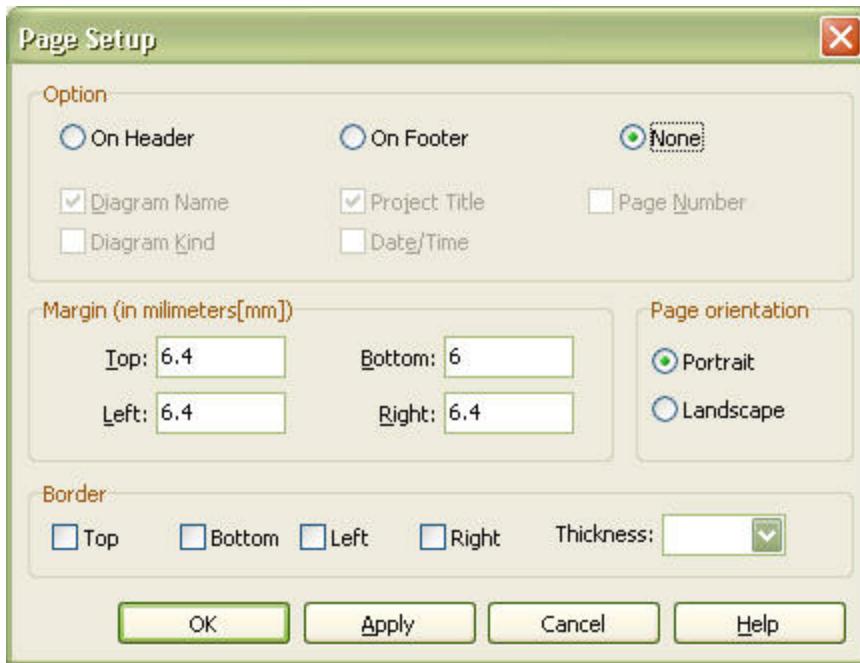
This toggles the icon size for the framework list. Select the small icon button if the framework names are shortened and difficult to read.

Description

This area shows a brief description of the framework item selected from the list.

Page Setup Dialog Box

The Page Setup dialog box allows the user to specify what and how diagram information is printed, the paper orientation, margins, outlines, etc.



Option

The user can specify some of the diagram information to be printed.

- On Header : Prints the diagram information in the page header.
- On Footer : Prints the diagram information in the page footer.
- None : Does not print the diagram information.
- Diagram Name : Prints the diagram name.
- Project Title : Prints the project name of the diagram.
- Page Number : Prints the page number.
- Diagram Kind : Prints the diagram kind.
- Date/Time : Prints the current date and time.

Margin

The user can specify the top, bottom, left, and right page margins in millimeters.

Page orientation

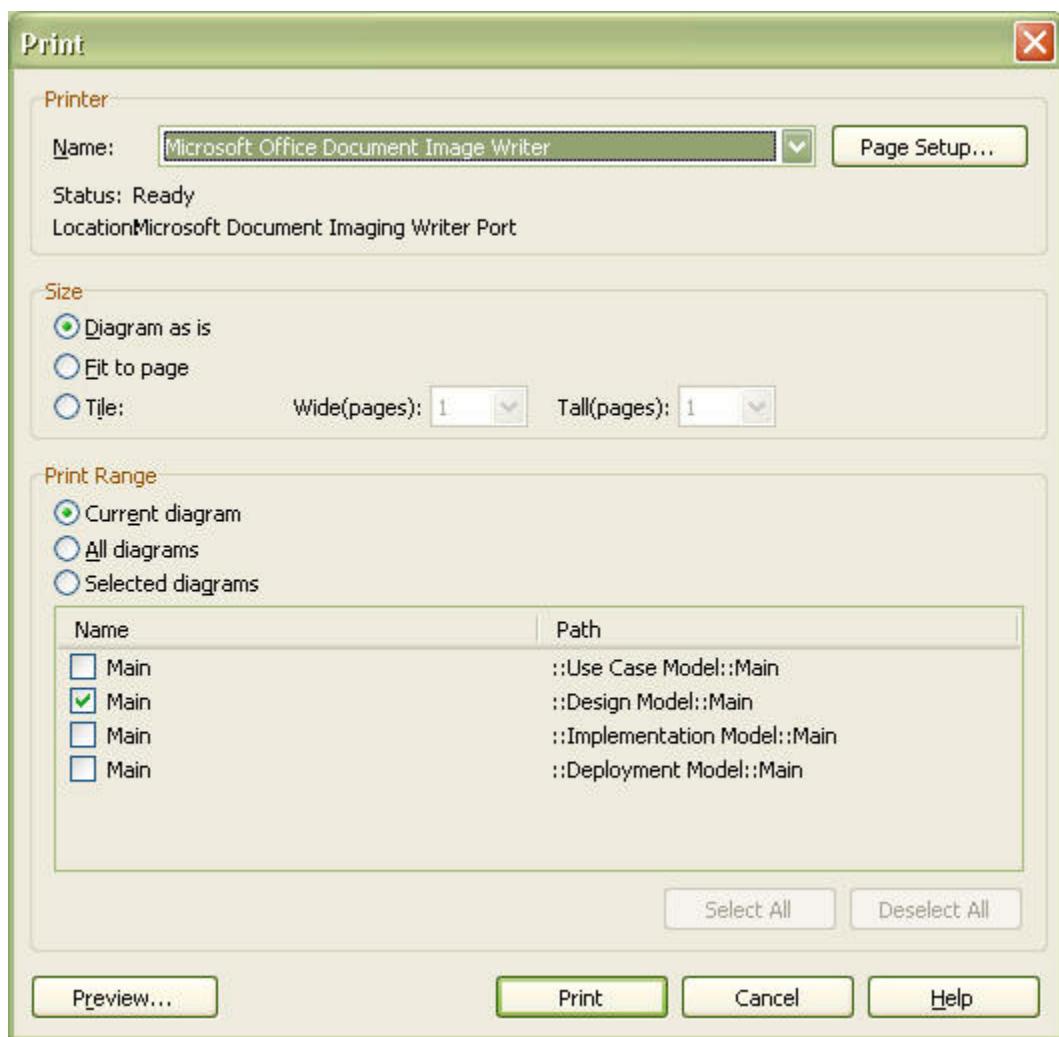
The user can specify whether to print the page in portrait or landscape.

Border

The user can specify how the page border will be printed. Select top, bottom, left, or right for drawing border and specify the border thickness.

Print Dialog Box

The Print dialog box appears when the user prints a diagram. The user can select and specify various options related to printing.



Printer

The user can configure the printer-related options.

- Name : Select a printer to use from the installed printers.
- Status : Indicates the status of the selected printer.
- Location : Indicates the location of the selected printer.
- Page Setup : Opens the Page Setup dialog box.

Size

Specifies the size of the diagram to print.

- Diagram as is : Prints the diagram in its original size. The diagram is printed in multiple pages if it does not fit in one page.
- Fit to page : Prints the diagram to fit in one page. This option prevents printing of multiple pages if the diagram is large.
- Tile : Prints the diagram to fit in multiple pages. The user can specify the number of pages to print by width and height (e.g. 3 pages wide and 4 pages tall = total 12 pages).

Print Range

Specifies the range of the diagram to print.

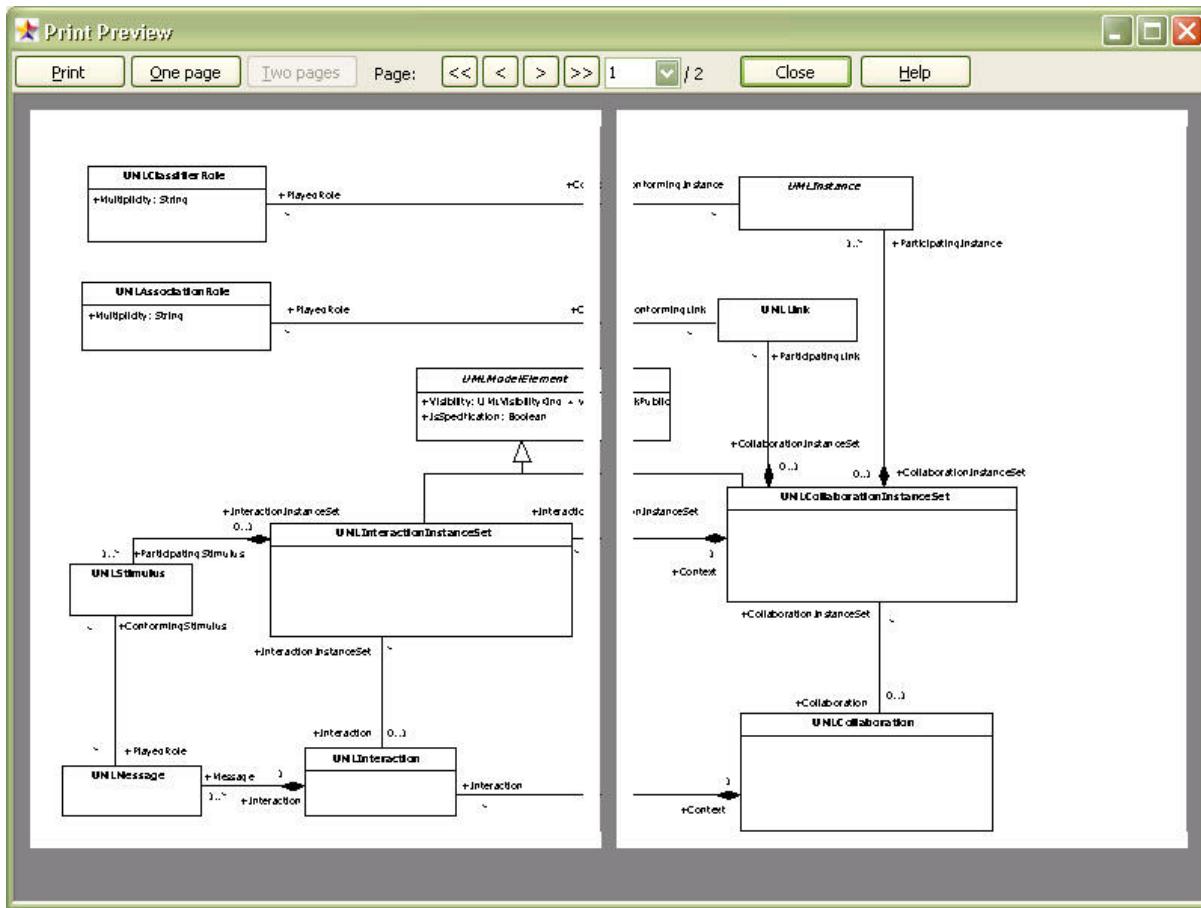
- Current diagram : Prints only the currently active diagram.
- All diagrams : Prints all of the diagrams in the current project.
- Selected diagrams : Prints only the selected diagram. The **[Select All]** button selects all diagrams, and the **[Deselect All]** button deselects all diagrams.

Preview

Opens the Preview dialog box.

Print Preview Dialog Box

The Print Preview dialog box allows the user to preview the print result before actually printing the diagram.



Print

Starts printing.

One Page / Two Pages

Toggles preview by one page or two pages.

<<, <, >, >>

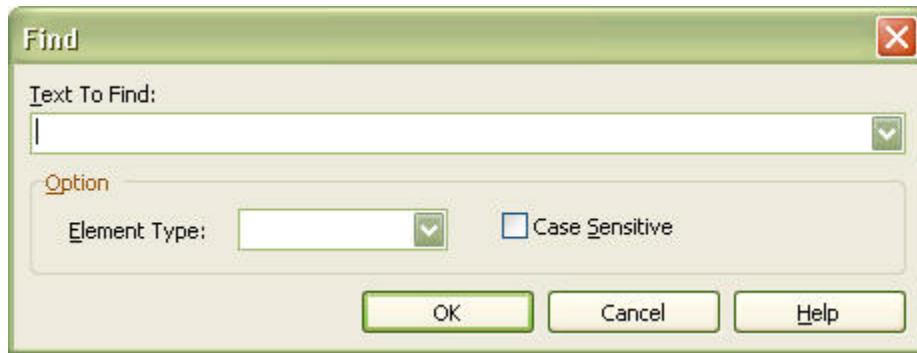
Allows navigation to the first page, previous page, next page, and last page.

Page Selection

The user can move to a specific page by directly entering the page number.

Find Dialog Box

The Find dialog box allows the user to find elements quickly and easily.



Text to Find

Enter the full or partial string for the element to find. The user can also select from the previously entered strings.

Option-Element Type

This specifies the range of elements to find. Available ranges: 'All elements', Model, Subsystem, Package, Class, Interface, Enumeration, Signal, Exception, Component, Node, Instance, UseCase, and Actor.

Option-Case Sensitive

This specifies lowercase or uppercase for the element to find.

Verify Model Dialog Box

The Verify Model dialog box is used to inspect the model elements and their definitions.



Verification Rule

Shows the verification rule currently being applied.

Verifying Element

Shows the name of the element currently being verified.

Progress

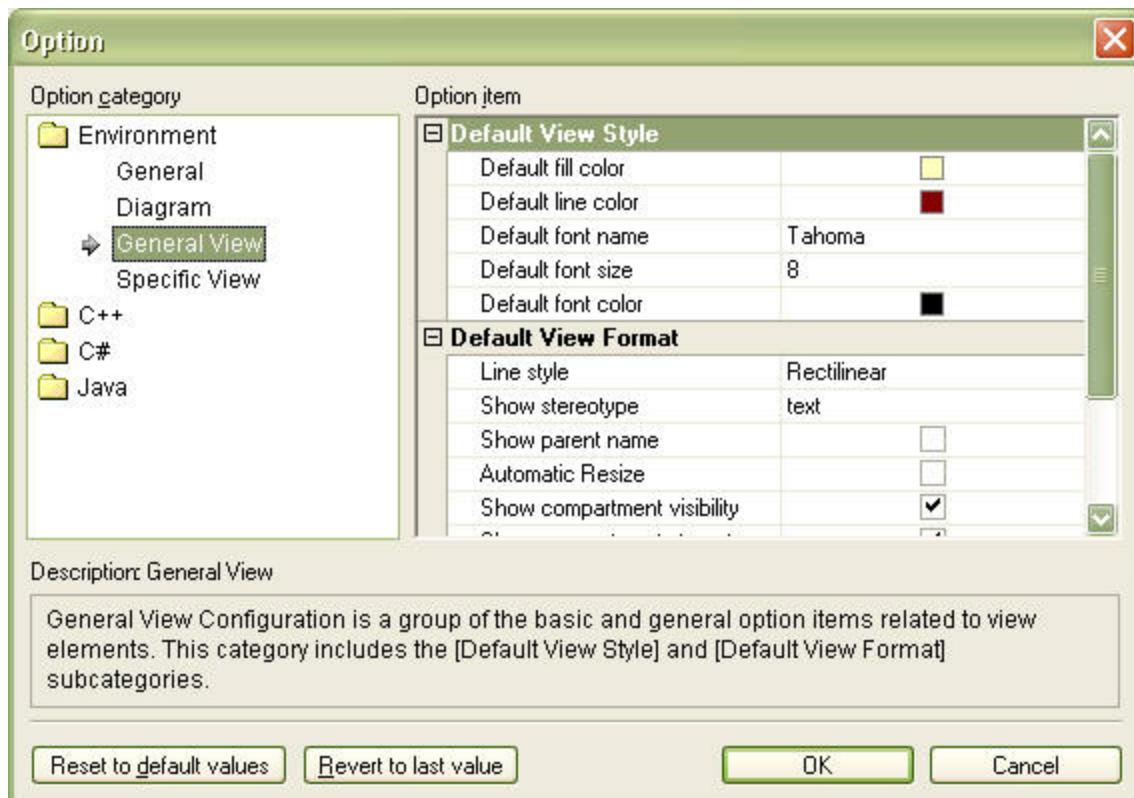
Visually displays the progress of the verification.

Failed

Indicates the number of the elements that failed the verification.

Options Dialog Box

The Options dialog box lists the various option items for environment configuration of WhiteStarUml and allows the user to edit them.



Option category

This list shows the option categories. The top category is "Environment" which contains the sub-categories "General", "Diagram", "General View", and "Specific View". Additional option categories may be present depending on the module of WhiteStarUml.

Option item

Shows the option items contained in the selected option category. The option values can be edited.

Description

Shows a brief description of the selected option category or item.

Reset to default values

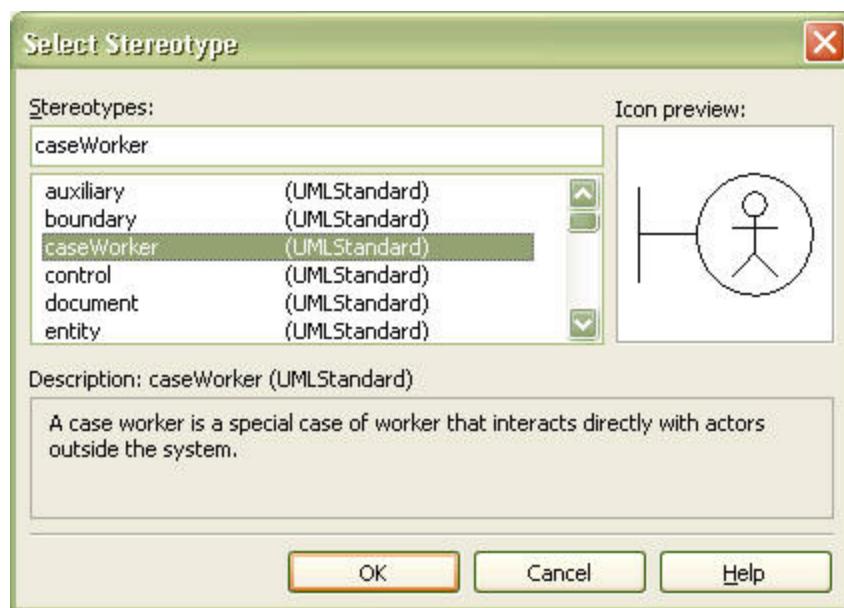
Sets the selected option item value to the default value.

Revert to last value

Reverts the selected option item value to the last saved value.

Select Stereotype Dialog Box

The Select Stereotype dialog box appears when the user needs to specify a stereotype for the selected element. The stereotype can be entered directly or selected from the list.



Stereotypes

The user can directly enter the stereotype. If a stereotype has been registered, it is indicated in the stereotype list.

Stereotypes List

Shows the stereotypes defined in the UML profiles that are in use by the current project. The name of the stereotype and the name of the project that contains it are shown together. The user can select a stereotype from the list.

Icon preview

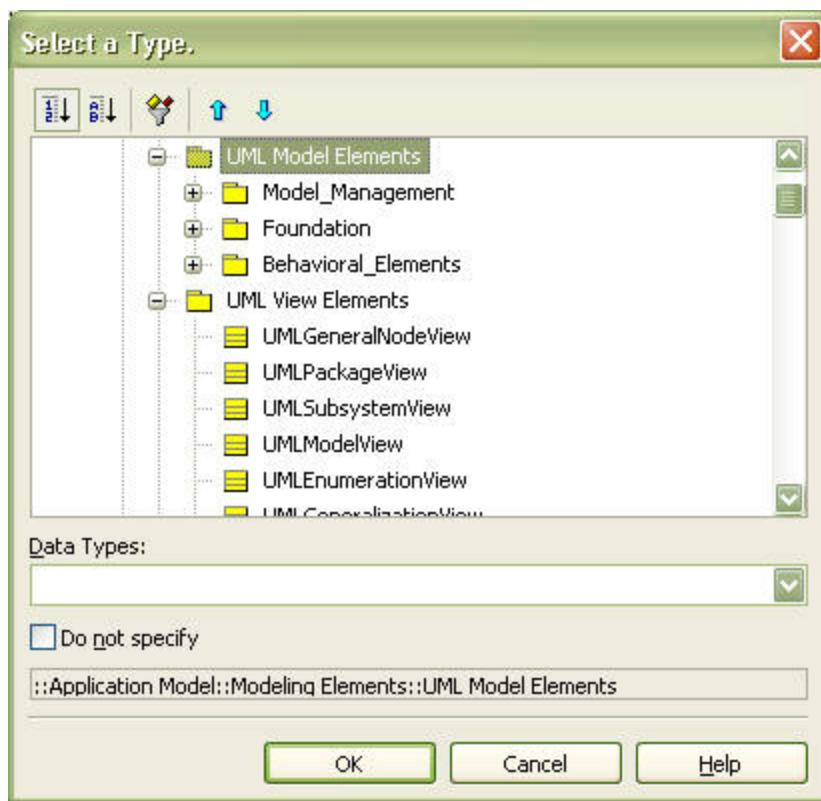
The icon is shown if the selected stereotype is associated with an icon.

Description

Shows the description for the selected stereotype.

Select Element Dialog Box

The Select Element dialog box allows the user to select an element from the hierarchical structure of the project elements. The Select Element dialog box appears when the user needs to assign an element at the property editor, collection editor, etc. Unlike the Element List dialog box, the Select Element dialog box lists the elements in a hierarchical structure.



Dialog Box Title

The dialog box title changes according to the type of the element to be selected. An appropriate title is displayed for defining the attribute type, or the object type (i.e., Classifier).

Element List

Shows the available elements. For example, only the StateMachine elements are displayed when selecting a StateMachine element.

Data Types

Shows the available data types. The data types shown here are those defined in the UML profiles which are in use by the current project. This list may not be shown if a data type does not need to be specified.

Do not specify

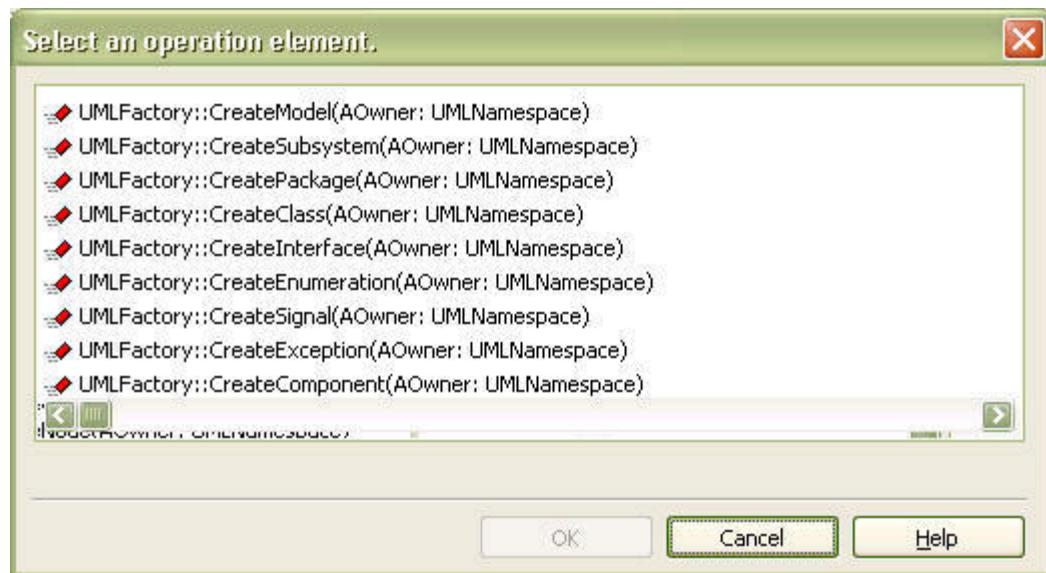
Check this to specify nothing. This actually assigns a null value.

Selected Element

The bottom part of the dialog box shows the full pathname of the selected element. This information can be used to verify which element is currently selected.

Element List Dialog Box

The Element List dialog box allows the user to select an element from a list. The Select Element dialog box appears when the user needs to assign an element to a specific property at the property editor, collection editor, etc. Unlike the Select Element dialog box, the Element List dialog box lists the elements in a one-dimensional list.



Dialog Box Title

The dialog box title changes according to the type of the element to be selected. An appropriate title is displayed for selecting a StateMachine, or for assigning a component in a node.

Element List

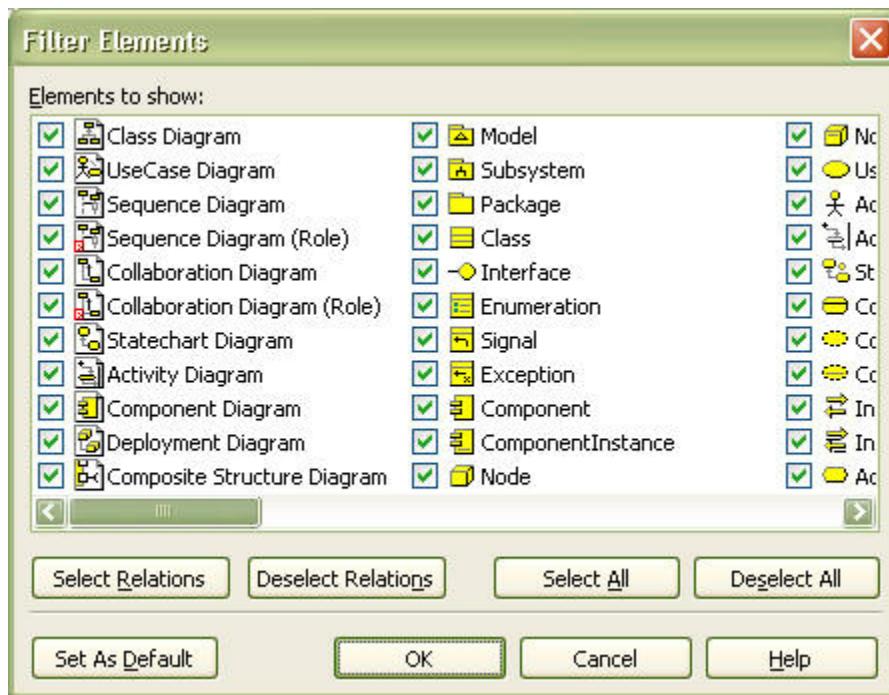
Shows the available elements. For example, only the StateMachine elements are displayed when selecting a StateMachine element.

Do not specify

Check this to specify nothing. This actually assigns a null value.

Model Filtering Dialog Box

The Model Filter dialog box can be used to show or hide specific elements in the model explorer.



Element to show

Shows all the elements that can be displayed in the model explorer. Only those checked are displayed in the model explorer.

Select Relations

Selects all the relationship elements (*Transition, Dependency, Association, AssociationClass, Generalization, Link, AssociationRole, Stimulus, Message, Include, Extend, and Realization*) from the elements list.

Deselect Relations

Deselects all the relation elements.

Select All

Selects all elements.

Deselect All

Deselects all elements.

Set As Default

Selects the elements set as default by the program.

12.6 Quick Dialogs

This section describes in detail all the quick dialogs available in WhiteStarUML.

- General Quick Dialog
- Subsystem Quick Dialog
- Classifier Quick Dialog
- Enumeration Quick Dialog
- Literal Quick Dialog
- Attribute Quick Dialog
- Operation Quick Dialog
- AssociationEnd Quick Dialog
- Object Quick Dialog
- ClassifierRole Quick Dialog
- Message/Stimulus Quick Dialog
- State Quick Dialog
- Action Quick Dialog
- Note/Text Quick Dialog

General Quick Dialog

General Quick Dialog is the most general form of the quick dialogs. This is used for most of the elements. This appears when an element is double-clicked in diagram. Hitting the [Enter] key or clicking outside the quick dialog applies the changes.



Visibility Button

Element visibility can be selected from Public, Protected, Private, and Package.



Element name, visibility and stereotype can be entered in the edit field according to the syntax.

Syntax

<< stereotype >> visibility name

- **<< stereotype >>** : Enter the stereotype name. This may be omitted.
- **visibility** : Enter the character that corresponds to the element's visibility ('+': public, '#': protected, '-': private, '~': package). This may be omitted.
- **name** : Enter the element's name.

Elements Applied

Subsystem Quick Dialog

Subsystem Quick Dialog is applied only to subsystem elements. This appears when a subsystem is double-clicked in a diagram. Hitting the [Enter] key or clicking outside the quick dialog applies the changes.



Visibility Button

Subsystem visibility can be selected from Public, Protected, Private, and Package.

Edit Field

Subsystem name, visibility and stereotype can be entered in the edit field according to the syntax.

Syntax

<< stereotype >> visibility name

- **<< stereotype >>** : Enter the stereotype name. This may be omitted.
- **visibility** : Enter the character that corresponds to the subsystem's visibility ('+': public, '#': protected, '-': private, '~': package). This may be omitted.
- **name** : Enter the subsystem's name.

Add Operation Button

Creates and adds a new operation.

Elements Applied

Subsystem

Classifier Quick Dialog

Classifier Quick Dialog is applied only to the elements that fall in the Classifier category (e.g. Class, Actor, Signal, ...). Hitting the **[Enter]** key or clicking outside the quick dialog applies the changes.

**Visibility Button**

Element visibility can be selected from Public, Protected, Private, and Package.

Edit Field

Element name, visibility and stereotype can be entered in the edit field according to the syntax.

Syntax

<< stereotype >> visibility name

- **<< stereotype >>** : Enter the stereotype name. This may be omitted.
- **visibility** : Enter the character that corresponds to the element's visibility ('+': public, '#': protected, '-': private, '~': package). This may be omitted.
- **name** : Enter the element's name.

Add Attribute Button

Creates and adds a new attribute.

Add Operation Button

Creates and adds a new operation.

Elements Applied

Class, Interface, Signal, Exception, Actor, UseCase, Artifact

Enumeration Quick Dialog

Enumeration Quick Dialog is applied only to enumeration elements. This appears when an enumeration is double-clicked in a diagram. Hitting the [Enter] key or clicking outside the quick dialog applies the changes.



Visibility Button

Enumeration visibility can be selected from  Public,  Protected,  Private, and  Package.

Edit Field

Enumeration name, visibility and stereotype can be entered in the edit field according to the syntax.

Syntax

<< stereotype >> visibility name

- **<< stereotype >>** : Enter the stereotype name. This may be omitted.
- **visibility** : Enter the character that corresponds to the enumeration's visibility ('+': public, '#': protected, '-': private, '~': package). This may be omitted.
- **name** : Enter the enumeration's name.

Add Literal Button

Creates and adds a new literal.

Add Operation Button

Creates and adds a new operation.

Elements Applied

Enumeration

Attribute Quick Dialog

Attribute Quick Dialog is applied only to attribute elements. This appears when an attribute is double-clicked in a diagram. Hitting the [Enter] key or clicking outside the quick dialog applies the changes.



Visibility Button

Attribute visibility can be selected from  Public,  Protected,  Private, and  Package.

Edit Field

Attribute stereotype, visibility, name, type, multiplicity, order and default value can be entered in the edit field according to the syntax.

Syntax

<< stereotype >> visibility name : type = initialValue

- **<< stereotype >>** : Enter the stereotype name. This may be omitted.
- **visibility** : Enter the character that corresponds to the attribute's visibility ('+': public, '#': protected, '-': private, '~': package). This may be omitted.
- **name** : Enter the attribute's name.
- **: type** : Enter the attribute's type. This may be omitted.
- **= initialValue** : Enter the attribute's default value. This may be omitted.

Note

- Quick Dialog doesn't supports a part of [multiplicity ordered] among attribute notations in UML Specification. Because it has been used part of type as [] symbol to the meaning of array.

Add Button

This adds a new attribute in the next location. Hitting **[Ctrl + Enter]** has the same effect. To insert in the current location, hit the **[Ins]** key.

Delete Button

This deletes the attribute. Hitting **[Ctrl + Del]** has the same effect.

Move Up Button

This moves the current attribute up. Hitting **[Ctrl + Up]** has the same effect. To edit the upper attribute, just hit the **[Up]** key.

Move Down Button

This moves the current attribute down. Hitting **[Ctrl + Down]** has the same effect. To edit the lower attribute, just hit the **[Down]** key.

Elements Applied

Attribute

Operation Quick Dialog

Operation Quick Dialog is applied only to operation elements. This appears when an operation is double-clicked in a diagram. Hitting the **[Enter]** key or clicking outside the quick dialog applies the changes.



Visibility Button

Operation visibility can be selected from Public, Protected, Private, and Package.

Edit Field

Operation stereotype, visibility, name, parameter, and return type can be entered in the edit field according to the syntax.

Syntax

```
<< stereotype >> visibility name( parameters ) : returntype
```

- **<< stereotype >>** : Enter the stereotype name. This may be omitted.
- **visibility** : Enter the character that corresponds to the operation's visibility ('+': public, '#': protected, '-': private, '~': package). This may be omitted.
- **name** : Enter the operation's name
- **(parameters)** : Enter the operation's parameters. Parameters follow the syntax of "direction name : type" and the parameters are separated by comma (,). Parameter relay direction is indicated by 'direction'; it can be 'in', 'inout', or 'out'. Parameter name is indicated by 'name', and parameter type is indicated by 'type'. This may be omitted.
- **: returntype** : Enter the operation's return type. This may be omitted.

Add Button

This adds a new operation in the next location. Hitting **[Ctrl + Enter]** has the same effect. To insert in the current location, hit the **[Ins]** key.

Delete Button 

This deletes the operation. Hitting [**Ctrl + Del**] has the same effect.

Move Up Button 

This moves the current operation up. Hitting [**Ctrl + Up**] has the same effect. To edit the upper operation, just hit the [**Up**] key.

Move Down Button 

This moves the current operation down. Hitting [**Ctrl + Down**] has the same effect. To edit the lower operation, just hit the [**Down**] key.

Elements Applied

Operation

Literal Quick Dialog

Literal Quick Dialog is applied only to literal elements. This appears when a literal is double-clicked in a diagram. Hitting the [**Enter**] key or clicking outside the quick dialog applies the changes.

**Visibility Button** 

Literal visibility can be selected from  Public,  Protected,  Private, and  Package.



Literal name, visibility and stereotype can be entered in the edit field according to the syntax.

Syntax

`<< stereotype >> visibility name`

- **<< stereotype >>** : Enter the stereotype name. This may be omitted.
- **visibility** : Enter the character that corresponds to the literal's visibility ('+': public, '#': protected, '-': private, '~': package). This may be omitted.
- **name** : Enter the literal's name.

Add Button 

This adds a new literal in the next location. Hitting **[Ctrl + Enter]** has the same effect. To insert in the current location, hit the **[Ins]** key.

Delete Button 

This deletes the literal. Hitting **[Ctrl + Del]** has the same effect.

This moves the current literal up. Hitting **[Ctrl + Up]** has the same effect. To edit the upper literal, just hit the **[Up]** key.

Move Up Button 

This moves the current literal up. Hitting **[Ctrl + Up]** has the same effect. To edit the upper literal, just hit the **[Up]** key.

Mouse Down Button 

This moves the current literal down. Hitting **[Ctrl + Down]** has the same effect. To edit the lower literal, just hit the **[Down]** key.

Elements Applied

Literal

AssociationEnd Quick Dialog

AssociationEnd Quick Dialog is applied only to AssociationEnd elements. This appears when an association is double-clicked at the end in a diagram. Hitting the **[Enter]** key or clicking outside the quick dialog applies the changes.



Aggregation Button 

AssociationEnd aggregation can be selected from  Association,  Aggregation, and  Composition Navigability can be configured by checking.

Visibility Button 

AssociationEnd visibility can be selected from  Public,  Protected,  Private, and  Package.

Edit Field 

AssociationEnd name, visibility and stereotype can be entered in the edit field according to the syntax.

Syntax

<< stereotype >> visibility name

- **<< stereotype >>** : Enter the stereotype name. This may be omitted.
- **visibility** : Enter the character that corresponds to the AssociationEnd's visibility ('+': public, '#': protected, '-': private, '~': package). This may be omitted.
- **name** : Enter the AssociationEnd's name.

Multiplicity Combo 

AssociationEnd's multiplicity can be selected from 0..1, 1, 0..*, 1..*, and * or entered directly.

Elements Applied

AssociationEnd, LinkEnd, AssociationEndRole

ClassifierRole Quick Dialog

ClassifierRole Quick Dialog is applied only to ClassifierRole elements. This appears when a Classifier is double-clicked in a diagram. Hitting the **[Enter]** key or clicking outside the quick dialog applies the changes.



Visibility Button

ClassifierRole visibility can be selected from Public, Protected, Private, and Package.



ClassifierRole name, visibility and stereotype can be entered in the edit field according to the syntax.

Syntax

<< stereotype >> visibility name : type

- **<< stereotype >>** : Enter the stereotype name. This may be omitted.
- **visibility** : Enter the character that corresponds to the ClassifierRole's visibility ('+': public, '#': protected, '-': private, '~': package). This may be omitted.
- **name** : Enter the ClassifierRole's name.
- **: type** : Enter the ClassifierRole's type name. This has to be one of the classifiers defined in the current project. This may be omitted.

Create New Class Element Button

This creates a new class element in the parent namespace of the collaboration where the ClassifierRole element belongs, and references the new class element in the ClassifierRole's base attribute.

Elements Applied

ClassifierRole

Object Quick Dialog

Object Quick Dialog is applied only to object elements. This appears when an object is double-clicked in a diagram. Hitting the **[Enter]** key or clicking outside the quick dialog applies the changes.

**Visibility Button**

Object visibility can be selected from Public, Protected, Private, and Package.



Object stereotype, visibility, name and type can be entered in the edit field according to the syntax.

Syntax

<< stereotype >> visibility name : type

- **<< stereotype >>** : Enter the stereotype name. This may be omitted.
- **visibility** : Enter the character that corresponds to the object's visibility ('+': public, '#': protected, '-': private, '~': package). This may be omitted.
- **name** : Enter the object's name.
- **: type** : Enter the object's type name. This has to be one of the classifiers defined in the current project. This may be omitted.

Create New Class Element Button

This creates a new class element in the parent namespace of the CollaborationInstanceSet where the object element belongs, and references the new class element in the object's classifier attribute.

Elements Applied

Object

Message/Stimulus Quick Dialog

Message/Stimulus Quick Dialog is applied only to message and stimulus elements. This appears when a message or a stimulus is double-clicked in a diagram. Hitting the **[Enter]** key or clicking outside the quick dialog applies the changes.



(for collaboration diagram)

Connect Element Button

This connects specific elements according to the message or stimulus type. If the message or stimulus has CallAction, one of the operations of the object on the other end can be selected. If it is a CreateAction, it can connect a Classifier. If it is a SendAction, it can connect a Signal element.

Visibility Button

Message or stimulus visibility can be selected from Public, Protected, Private, and Package.

Edit Field

Message or stimulus name, visibility and stereotype can be entered in the edit field according to the syntax.

Syntax

<< stereotype >> *[iteration] [condition] return := messagename (arguments)

- **<< stereotype >>** : Enter the stereotype name. This may be omitted.
- ***[iteration]** : Enter the message or stimulus's iteration. This can be in the format of "* [i=1..100]". This may be omitted.
- **[condition]** : Enter the message or stimulus's condition. This may be omitted.
- **return :=** : Enter the expression for the message or stimulus's result. This may be omitted.
- **messagename** : Enter the message or stimulus's name.
- **(arguments)** : Enter the expression for the arguments passed to the message or stimulus. This may be omitted.

Sequence number (for Collaboration Diagram)

The sequence number, which indicates the execution order of the message or stimulus, can be changed.

Create New Operation Button 

If the message or stimulus has a CallAction, this button creates a new operation in the other object, and references the new operation in the CallAction's operation attribute.

Elements Applied

Message, Stimulus

State Quick Dialog

State Quick Dialog is applied only to state elements (CompositeState and SubmachineState). Hitting the **[Enter]** key or clicking outside the quick dialog applies the changes.

**Visibility Button** 

State visibility can be selected from  Public,  Protected,  Private, and  Package.



State name, visibility and stereotype can be entered in the edit field according to the syntax.

Syntax

<< stereotype >> visibility name

- **<< stereotype >>** : Enter the stereotype name. This may be omitted.
- **visibility** : Enter the character that corresponds to the state's visibility ('+': public, '#': protected, '-': private, '~': package). This may be omitted.
- **name** : Enter the state's name.

Add EntryAction Button 

Creates and adds a new EntryAction.

Add DoAction Button 

Creates and adds a new EntryAction.

Add ExitAction Button 

Creates and adds a new ExitAction.

Elements Applied

CompositeState, SubmachineState

Action Quick Dialog

Action Quick Dialog is applied only to action elements (EntryAction, DoAction, and ExitAction). Hitting the **[Enter]** key or clicking outside the quick dialog applies the changes.

**Visibility Button** 

Action visibility can be selected from  Public,  Protected,  Private, and  Package.

Edit Field 

Action name, visibility and stereotype can be entered in the edit field according to the syntax.

Syntax

<< stereotype >> visibility name

- **<< stereotype >>** : Enter the stereotype name. This may be omitted.
- **visibility** : Enter the character that corresponds to the action's visibility ('+': public, '#': protected, '-': private, '~': package). This may be omitted.
- **name** : Enter the action's name.

Add Button 

This adds a new action in the next location. Hitting **[Ctrl + Enter]** has the same effect. To insert in the current location, hit the **[Ins]** key.

Delete Button 

This deletes the action. Hitting **[Ctrl + Del]** has the same effect.

Move Up Button 

This moves the current action up. Hitting **[Ctrl + Up]** has the same effect. To edit the upper action, just hit the **[Up]** key.

Move Down Button 

This moves the current action down. Hitting **[Ctrl + Down]** has the same effect. To edit the lower action, just hit the **[Down]** key.

Elements Applied

UninterpretedAction(EntryAction, DoAction, ExitAction)

Note/Text Quick Dialog

Note/Text Quick Dialog is applied only to note elements and text elements. This appears when a note or text element is double-clicked in a diagram. Hitting **[Ctrl + Enter]** or clicking outside the quick dialog applies the changes.

**Edit Field**

The edit field can contain any contents.

Elements Applied

Note, Text

12.6.1 Element Creation Shorthand

The QuickDialog of a number of elements, allow Element Creation Shorthand. You can quickly create the relationships of an element using the element creation shorthand. Shorthand consists of flat text that you enter in the QuickDialog of an element.

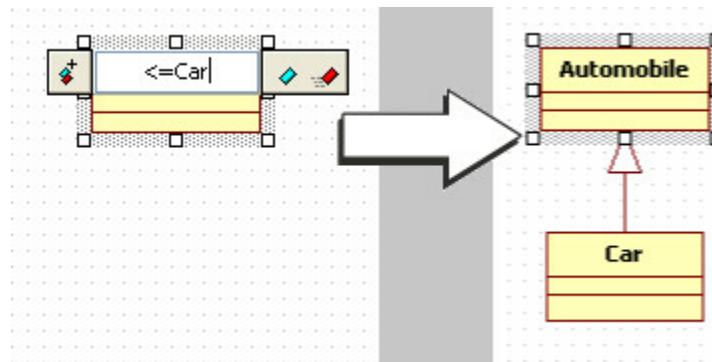
You start the shorthand with relationship notation followed by the name of a target element. The shorthand will create a relationship between the current element and the target element. If the name is already used for an element in the model, then a relation is created to the existing element. If the name is not already used, then a new element is created as appropriate for the diagram type and related to the current element.

To create the relations of an element

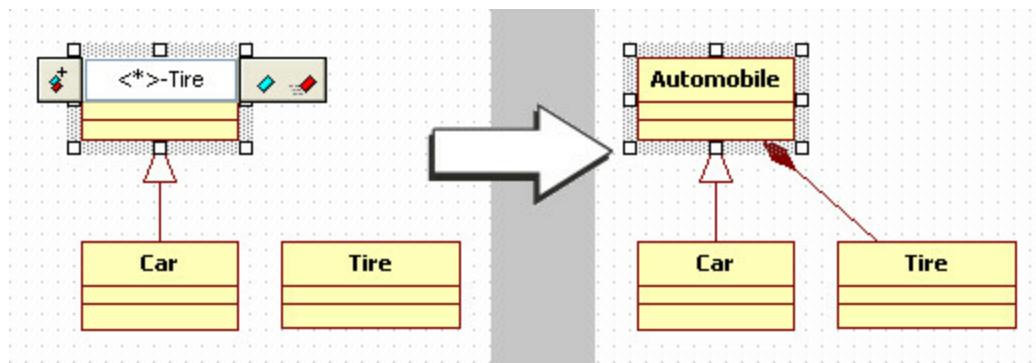
- 1.In the diagram, select an element.
- 2.Press **Enter** and type the element creation shorthand in the name box. The shorthand will not overwrite the name of the element.
- 3.Finish the shorthand by pressing the **Enter** key.

For example, for a class Automobile as the current element:

- "<=Car" creates a class Car as a specialization of the current Automobile class.



- "<*>-Tire" relates a class Tire as a composition to the current Automobile class.



The following tables describe the relationship notation for the various diagram types and element types.

Class Diagram, Component Diagram, Deployment Diagram and Composite Structure Diagram

Relationship Notation	Current Element	Created relation
\leq	Classifier	Specialization of the target element
$=>$	Classifier	Generalization of the target element
--	Classifier	Association between current element and target element
$<-$	Classifier	Association navigable from the target element to the current element
$->$	Classifier	Association navigable from the current element to the target element
$<>-$	Classifier	Aggregation of the target element in the current element
$-<>$	Classifier	Aggregation of the current element in the target element
$<*>-$	Classifier	Composition of the target element in the current element
$-<*>$	Classifier	Composition of the current element in the target element
$<--$	Classifier	Dependency of the target element to the current element
$-->$	Classifier	Dependency of the current element to the target element
)-	Classifier	Requirement of the current element
-()	Classifier	Requirement of the target element
@-	Classifier	Realization of the target element from the current element
-@	Classifier	Realization of the current element from the target element

Use Case Diagram

Relationship Notation	Current Element	Created Relation
(-)	UseCase	Communication between the current element (Use Case) and the target element (Actor)
-()	Actor	Communication between the current element (Actor) and the target element (Use Case)
<i-	UseCase	Include the target element (Use Case) in the current element (Use Case)
-i>	UseCase	Include the current element (Use Case) in the target element (Use Case)
<e-	UseCase	Extends the target element (Use Case) from the current element (Use Case)
-e>	UseCase	Extends the current element (Use Case) from the target element (Use Case)

Sequence Diagram and Sequence Diagram (Role)

Relationship Notation	Current Element	Created Relation
<-	Object, ClassifierRole	Stimulus from the target element to the current element
->	Object, ClassifierRole	Stimulus from the current element to the target element
<->	Object, ClassifierRole	Stimulus with return from the target element to the current element
<-	Stimulus, Message	Sub-stimulus coming from the target element to current stimulus
->	Stimulus, Message	Sub-stimulus coming from the current stimulus to the target element
<->	Stimulus, Message	Sub-stimulus with return coming from target element to the current stimulus.
<~	Stimulus, Message	Stimulus coming from the target element (Object) before the current stimulus
~>	Stimulus, Message	Stimulus going to the target element (Object) before the current stimulus
<_	Stimulus, Message	Stimulus coming from the target element (Object) after the current stimulus
_>	Stimulus, Message	Stimulus going to the target element (Object) after the current stimulus

Collaboration Diagram and Collaboration Diagram(Role)

Relationship Notation	Current Element	Created Relation
<-	Object, ClassifierRole	Stimulus from the target element to the current element
->	Object, ClassifierRole	Stimulus from the current element to the target element
<->	Object, ClassifierRole	Stimulus with return relationship from target element to the current element.

Statechart and Activity Diagram

Relationship Notation	Current Element	Created Relation
<-	State, ActionState	Transition from the target element(Action State) to the current element
->	State, ActionState	Transition from the current element to the target element(Action State)
-*	State, ActionState	Transition from current element to target element (Initial State)
-@	State, ActionState	Transition from current element to the target element (Final State)
<->	State, ActionState	Transition from the target element(Decision) to the current element
-><>	State, ActionState	Transition from the current element to the target element (Decision)
-(H) -(h)	State, ActionState	Transition from the current element to the target element (Shallow History)
-(H*) -(h*)	State, ActionState	Transition from the current element to the target element (Deep History)
<-	State, ActionState	Transition from the target element to the current element with a new Synchronization in between
->	State, ActionState	Transition from the current element to the target element with a new Synchronization in between

Chapter 13

13 Appendices

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