Software through Pictures®
Unified Modeling Language

Millennium Edition 8

Quick Reference

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Software through Pictures Unified Modeling Language Quick Reference

Millennium Edition 8

April 2001

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USE SHORTCUT MENUS AND GET HELP

Access Frequently-Used Commands	Click the right mouse button on a Model category or object on the Desktop or on an object, table cell, row, column or background area in an editor to display a context-sensitive, shortcut menu.
Access StP's Online Documentation	Choose **Help > Online Manuals**.

INSERT AND REPLACE SYMBOLS AND ARCS

Insert One or More Symbols into a Diagram	1. Select a symbol on the Symbols toolbar (or double-click it for multiple entry mode). 2. Click the left mouse button in the drawing area to insert the symbol (in multiple entry mode, click multiple times for more instances of the symbol). 3. Select Selection or another symbol on the Symbols toolbar to terminate multiple entry mode.
Draw One or More Arcs	1. Select the arc symbol on the Symbols toolbar (or double-click it for drawing multiple arcs). 2. Optionally select the arc type on the DefaultArcType toolbar. 3. Click the left mouse button on the source and destination objects to draw each link. 4. Select Selection or another symbol on the Symbols toolbar to terminate multiple entry mode.
Draw/Cancel Drawing of Right-Angled Arcs	Click the **Toggle Orthogonal Drawing** toolbar button to set / unset this drawing option.
Change an Object's Symbol Type	1. Select the object in the diagram. 2. Select the new symbol on the Symbols toolbar. 3. Choose **Replace** on the **Edit** or right-click menu.
Change an Arc Type	1. Select the arc in the diagram and choose **Replace** from the **Edit** or right-click menu. 2. Select an arc type in the dialog box and click **OK**.

SELECT AND REPOSITION SYMBOLS AND ARCS IN A DIAGRAM

Select a Single Element in a Diagram	Single-click the element with the left mouse button.
Select Multiple Elements in a Diagram	Select an element, press SHIFT and click the left mouse button on additional elements.
Select All Elements in One Area of a Diagram	Left-click the mouse in the drawing area and drag a dashed-line "bounding box" around the elements.
Reposition an Element in a Diagram	Drag and drop it with the left mouse button.
Reconnect an Arc	Select one end of the arc and drag and drop it on another object with the left mouse button.
Square up Non-Orthogonal Arcs	From the diagram's right-click menu, choose **Align All Links**.

LABEL AND RENAME OBJECTS

Edit a Name	Double-click a diagram element or table cell to display its label in edit mode; click outside an object label or table cell to terminate label edit mode.
Choose a Name from the System Repository	Select a diagram element or table cell and choose **Choose <object> Names** from the **Edit** or right-click menu; select a name from the list and click **OK**.
Rename an Object in the System Repository	Select a diagram element or table cell and choose **Edit > Rename Object Systemwide**.
Rename Objects Matching User Specifications	On the Desktop, choose **Tools > Multiple Global Rename**, select the element type, type a **Search Pattern** and a **Rename Pattern**, and click **OK**.

EDIT OBJECT PROPERTIES

1. Select an element in the diagram.
2. Click **Properties** toolbar button or choose **Properties** on **Edit** or right-click menu.
3. Select options and edit or enter values, then click **OK**.

EXTEND THE SEMANTICS OR CHARACTERISTICS OF SYMBOLS

1. Display the element's property sheet and enter values in the following fields:
   - **Stereotype**—Specify a symbol subclass
   - **Constraints**—Restrict values or apply conditions
   - **Tagged Values**—Add specific characteristics

   For constraints and tagged values, add one constraint or tagged value per line. For a new line, press the ENTER key.
2. Click **OK**.

ADD AN OBJECT DESCRIPTION

1. Select the diagram element or table cell and do one of the following:
   - Click the **Object Description** button on the toolbar.
   - Choose **Object Description** on the **Edit** or right-click menu.
   - Display the object's property sheet and click its **Object Description** button.
2. Type the description and click **OK**.

ADD AN ANNOTATION

1. To access the Object Annotation Editor (OAE):
   - From an editor, select an object, table cell, or an entire diagram or table, click the **Object/Cell Annotation** or **Diagram/Table Annotation** toolbar button or choose one of those commands on the **Edit** or right-click shortcut menu.
   - From the Desktop, open the **Repository View** and select a subcategory, select an object from the objects pane, and choose **Edit Annotation** [**of <object>**] on the **Tools** or right-click shortcut menu.
2. In the OAE, open the annotation folder and select an annotation, note, or item.
3. Add notes or items from the **Edit** menu, as appropriate.
4. Type item values and / or a note description in the **Description** field; click **Apply**.
5. Choose **File > Save**.

ATTACH AN EXTERNAL FILE

1. In the editor, select the diagram object or table cell (or none, to attach the file to the diagram or table itself) and click the appropriate **Diagram | Object | Table | Cell Annotation** toolbar button or choose the corresponding annotation command on the **Edit** or right-click menu.
2. In the Object Annotation Editor, open the annotation folder and select the Object note.
3. Choose **Edit > Add Item > External File**.
4. With the External File item still selected in the Annotations list, type the full path to the external file in the **Description** field and click **OK**.

CREATING PACKAGES AND SUBSYSTEMS

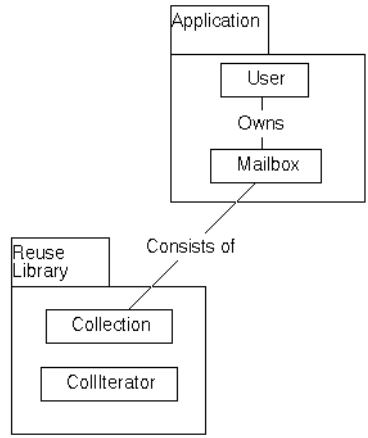
CREATE A PACKAGE.

A package, represented by a folder icon, is a general purpose symbol used in many types of UML diagrams to group symbols by category.

In StP/UML, the package symbol is also used to create subsystems.

To create a package:

1. From the Symbols toolbar, select, insert and label a package symbol in the diagram.
2. Add contents to the package by inserting other symbols inside it, or drag the package's "handles" to surround existing symbols.



CREATE A SUBSYSTEM

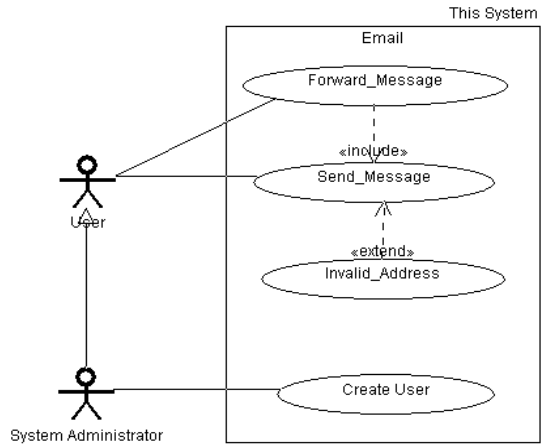
1. From the Symbols toolbar in a use case or class diagram, select, insert and label a package symbol.
2. Display the package's property sheet, click **Choose** in the **Stereotype** field, select the *subsystem* stereotype and click **OK** in each dialog box (click **Refresh Display Marks** toolbar button to make the *«subsystem»* display mark visible).
3. Assign model elements such as use cases or classes to a subsystem by scaling the subsystem package to surround those elements or by drawing elements inside it.

ASSIGN DIAGRAMS TO A SUBSYSTEM

1. Open the Desktop **ModelManagement View > Unassigned Diagrams** category.
2. Select file[s] from the Unassigned Files list.
3. From the right-click menu choose **Assign File to Subsystem**.
4. Select the subsystem in the dialog box that appears and click **OK**.

CREATE AN "INCLUDE," "EXTENDS" OR "GENERALIZATION" RELATIONSHIP

1. Select the arc symbol on the Symbols toolbar and the desired arc type on the DefaultArcType toolbar.
2. Draw the arc as follows, attaching each end by clicking on the object:
   - Include or extends—from client to provider usecase
   - Generalization—from sub-usecase(s) to general usecase
3. To change the relationship type of an existing arc, select the arc and choose **Edit** > **Replace**.



SHOW INHERITANCE

Select the arc symbol on the Symbols toolbar and draw an arc from the subclass actor to the superclass actor. By default, StP draws an inheritance link.

CREATE A USE CASE SCENARIO

You can decompose a use case to create a scenario in the form of a sequence, collaboration, or activity diagram.

Sequence or Collaboration

1. Select a use case symbol.
2. Choose **Go To** > **Scenario in Sequence Diagram** or **Scenario in Collaboration Diagram**.
3. In the **Create Scenario** dialog, type the scenario name and click **OK**.
   A new diagram appears with a scenario context symbol.

Activity

1. Select a use case symbol.
2. Choose **Go To** > **Scenario in Activity Diagram**.
   A confirmation box appears.
3. Click **OK**.
   The activity diagram appears with a state machine context symbol.

CLASS EDITOR

ADD ATTRIBUTES AND OPERATIONS TO A CLASS

1. Select an attribute or operation on the Symbols toolbar and left-click the mouse to insert it into a class symbol in the diagram.
2. Type a name for the attribute or operation in the label text box and press ENTER.
3. Select the class and choose **Go To > Class Table**.
4. Choose **View > Hide/Show**; select table sections you want to see and click **OK**.
5. Define the class attributes and operations in the class table and choose **Edit > Save** to save the table.

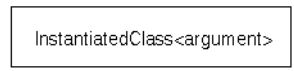
CREATE A RELATIONSHIP BETWEEN TWO CLASSES

1. Select an arc on the Symbols toolbar and a relationship type on the DefaultArcType toolbar.

2. Click the left mouse button on each class to draw a relationship arc between them.
3. To label the relationship, double-click the relationship arc, type a name in the label text box and press ENTER.

DRAW AN ANONYMOUS INSTANTIATED CLASS

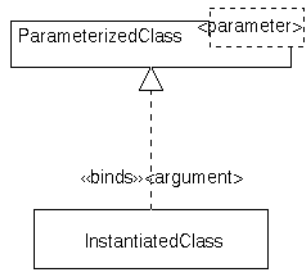
1. From the Symbols toolbar, select and insert an instantiated class symbol into the diagram.



2. Label the instantiated class in the format: **`ParameterizedClassName<ActualArguments>`**

DRAW A NAMED INSTANTIATED CLASS

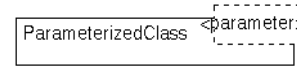
1. From the Symbols toolbar, select and insert an instantiated and a parameterized class symbol into the diagram; label them with different names.
2. Selecting an arc on the Symbols toolbar and an arc type of Binds on the DefaultArcType toolbar, draw a binds link from the instantiated class to the parameterized class.
3. With the arc still selected, choose **Edit > Properties** (or use **Properties** toolbar button).



4. In the **Properties** dialog box, type arguments in the **Bind Arguments** field, type **`binds`** in the **Stereotype** field, and click **OK**.

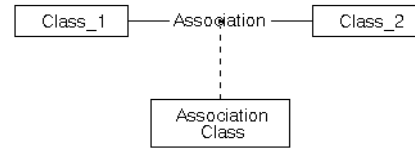
CLASS EDITOR

DRAW A PARAMETERIZED CLASS



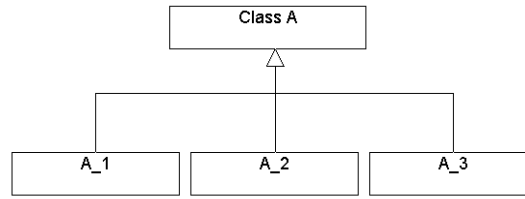
1. From the Symbols toolbar, select, insert and label a parameterized class symbol in the diagram.
2. To add parameters, choose **Edit** > **Properties** (or use **Properties** toolbar button).
3. Type the parameters in the **Parameters** field of the **Properties** dialog box.

ADD AN ASSOCIATION CLASS



1. From the Symbols toolbar, select, insert and label a class symbol in the diagram.
2. Select the association (link) that owns the association class.
3. Choose **UML > Create Association Class.**
   An arc appears connected to the association.
4. Drag the arc into the association class and click the left mouse button.

CREATE A GENERALIZATION TREE



1. Double-click the class symbol on the Symbols toolbar and left-click the mouse to insert and label a superclass and any number of subclasses.
2. Select Selection or another symbol on Symbols toolbar to terminate multiple entry mode.
3. SHIFT + left-mouse click to select subclasses to participate in the hierarchy.
4. From the **UML > Generalization Hierarchy** or right-click shortcut menu, choose **Draw Generalization Hierarchy**.
   When you move the pointer into the drawing area, the tree structure appears, joining subclasses at a vertex to a single link with one end attached to the pointer.
5. Move the pointer into the superclass and click the mouse to attach the link.

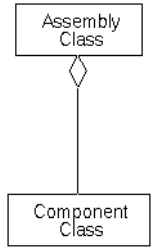
AUTO DRAW OR CONSTRUCT PACKAGES OR CLASSES

- **Automatically draw related classes**—Select a class, choose **UML > Auto Draw** and select an auto drawing option from the submenu.
- **Construct class from repository definitions**—Insert and label a class, choose **UML > Attributes and Operations** and select a command from the submenu.
- **Construct package from repository definitions**—Insert and label a package, choose **UML > Packages and Classes** and select a command from the submenu.

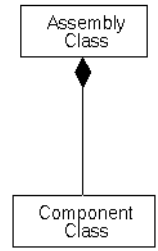
CLASS EDITOR

CREATE AN AGGREGATION OR COMPOSITION

1. Draw an aggregation arc between the assembly class and the component class.
2. With the arc selected, choose **Edit > Properties** (or **Properties** toolbar button).
3. In the dialog box, select **Composition** or **Aggregation** from the **Aggregation Type** options list for one end of the arc.
4. Click **OK**.



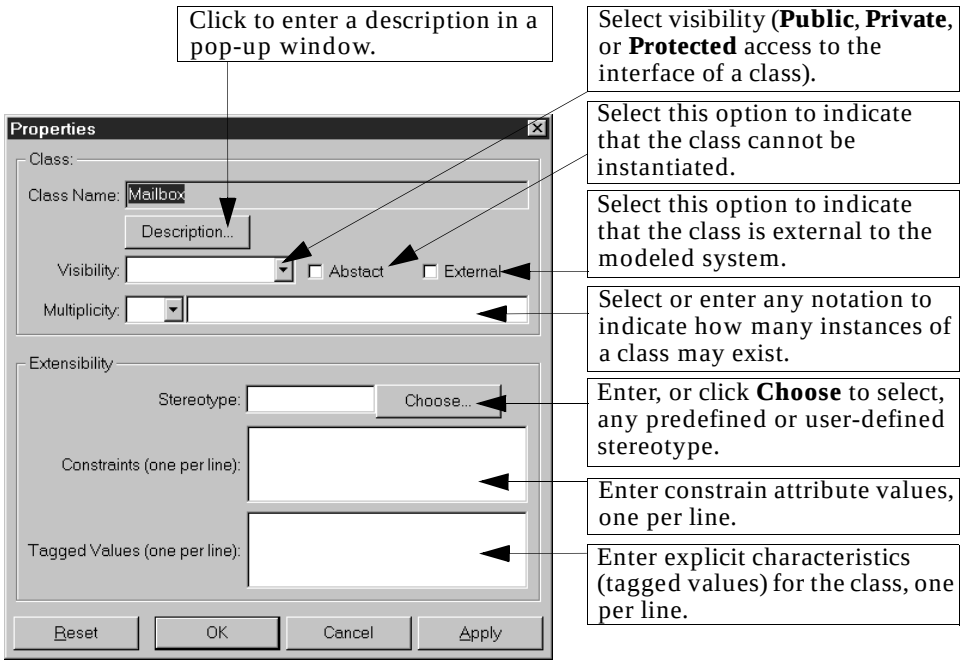
Aggregation



Composition

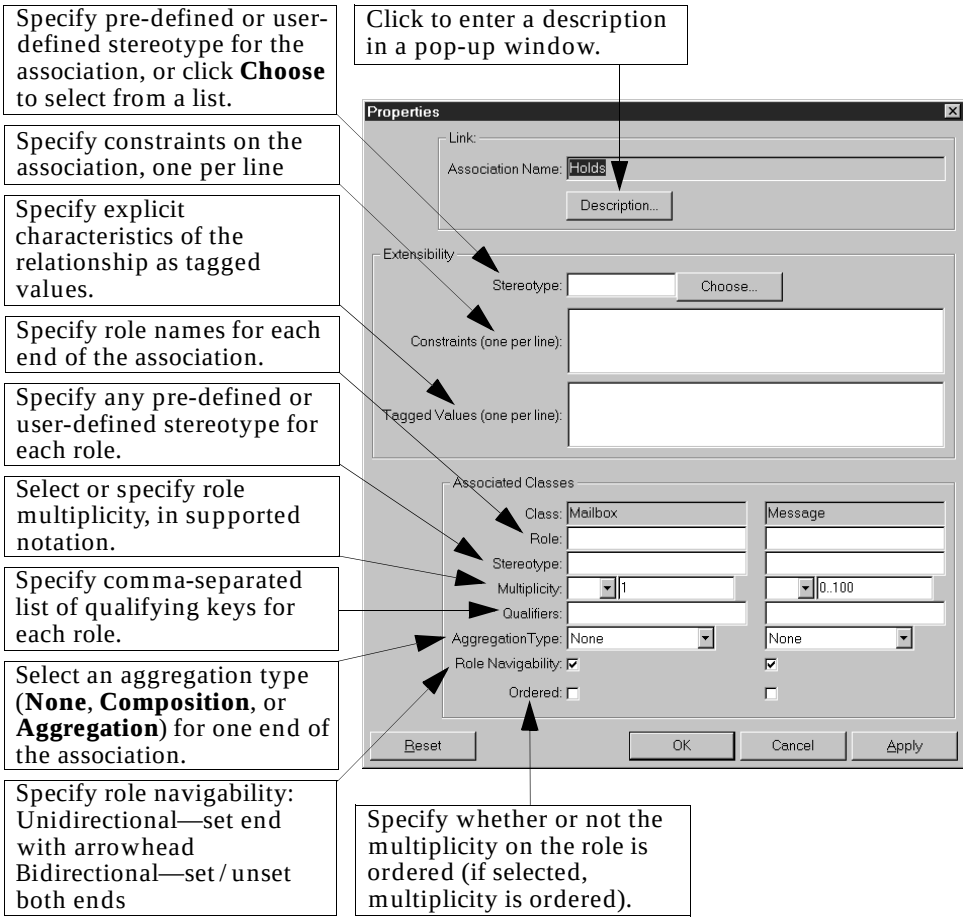
DEFINE CLASS PROPERTIES

1. Select a class symbol.
2. Click **Properties** toolbar button or choose **Properties** on **Edit** or right-click menu.
3. In the **Properties** dialog box, select options or enter values, then click **OK**.



DEFINE ASSOCIATION, AGGREGATION, OR COMPOSITION PROPERTIES

1. Select an association, aggregation, or composition link.
2. Click **Properties** toolbar button or choose **Properties** on **Edit** or right-click menu.
3. In the **Properties** dialog box, select options or enter values, then click **OK**.



DEFINE SPECIALIZED RELATIONSHIPS

1. Select a generalization, dependency, or binds link.
2. Click **Properties** toolbar button or choose **Properties** on **Edit** or right-click menu.
3. In the **Properties** dialog box, select options or enter values, then click **OK**.

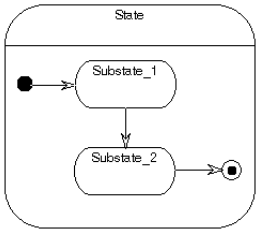
STATE EDITOR

ADD ACTIONS AND ACTIVITIES TO A STATE

1. Select a state in the state diagram.
2. Choose **Go To > State Table** from the menu bar or right-click menu.
3. When the confirmation box appears, click **OK**.
4. Type the actions and activities in the State Definition Table and save the table.

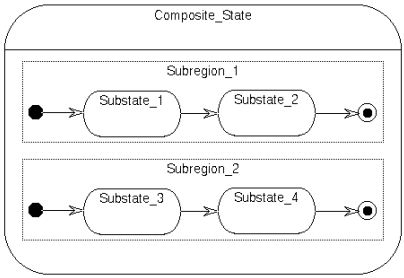
DECOMPOSE A STATE

1. Select a state.
2. Choose **Go To** > **Refine** on menu bar or right-click menu.
3. Click **OK** in the confirmation box.
   A lower-level diagram appears with the state represented as a composite state symbol.
4. Draw the substates within the composite state symbol.
5. Choose **File > Save** to save diagram.



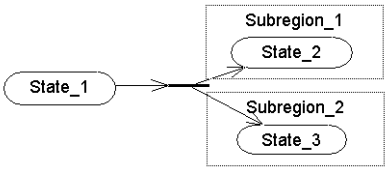
MODEL CONCURRENT ACTIVITIES

1. Insert two concurrent subregion symbols into the composite state and label them.
2. Resize the symbols, if necessary.
3. Model the transitions within each concurrent subregion symbol.



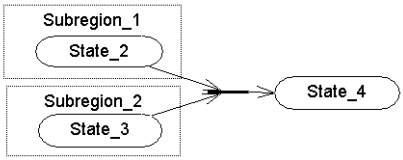
SPLIT A CONTROL FLOW

1. Draw a flow between state symbols.
2. Hold down the SHIFT key and select both the flow and a third state.
3. Choose **UML** > **Split Control**.



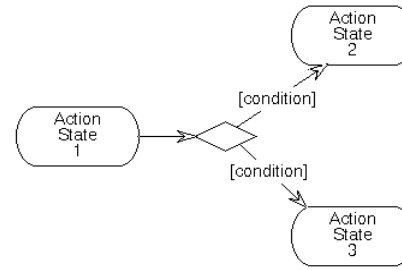
SYNCHRONIZE (MERGE) CONTROL FLOWS.

1. Select a flow
2. While pressing the SHIFT key, select a second flow.
3. Choose **UML** > **Synchronization Control**.



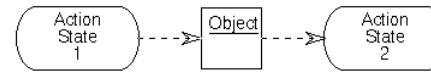
ACTIVITY EDITOR

DRAW A DECISION



1. From the Symbols toolbar, select and insert a decision symbol into the diagram.
2. Draw an arc from at least one action state to the decision symbol.
3. Draw arcs from the decision symbol to at least two action states.
4. Label each arc that leads from the decision symbol by one of these methods:
   - Type a guard condition within square brackets in the label text box.
   - Select an available guard from the arc's **Properties** sheet (with the arc selected, choose **Edit > Properties** and click **Choose** in the **Guard** field).

INCLUDE AN OBJECT

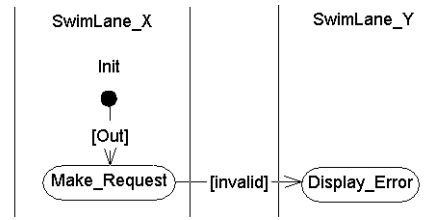


1. From the Symbols toolbar, select, insert, and label an object symbol in the diagram.
2. Draw an arc as follows:
   - From action state to object, if action state provides values to the object
   - From object to action state, if object provides values to the action state

REFINE AN ACTION STATE

1. Select the action state and choose **Go To** > **Diagram with Refined Action State**.
2. In the confirmation dialog, click **OK**.
   StP creates a decomposition diagram containing a state machine, both of which bear the same name as the parent action state.
3. Complete and save the decomposition diagram.

DRAW SWIM LANES



1. From the Symbols toolbar, insert swim lane symbols into an empty diagram and label them.
2. Drag and drop new or existing action states into a swim lane; label and link the action states as desired.
3. To lengthen or widen a swim lane, select it and drag one of its "handles" (action states must fit entirely within a swim lane to be associated with it).

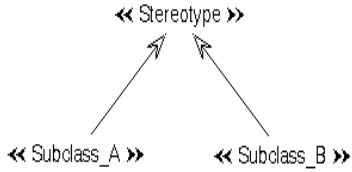
STEREOTYPE EDITOR

CREATE A STEREOTYPE WITH A PRE-DEFINED NAME

1. From the Symbols toolbar, select and insert a stereotype symbol into the diagram.
2. With the stereotype selected, choose **UML** > **Label with Predefined Stereotype**.
3. Select a predefined stereotype from the scrolling list, and click **OK**.

CREATE A STEREOTYPE HIERARCHY

1. Double-click the stereotype symbol on the Symbols toolbar and left-click the mouse to insert stereotype symbols into the diagram (select Selection or another Symbols toolbar symbol to terminate multiple entry mode).
2. Label the stereotypes. (Lower-level stereotypes must be user-defined.)
3. Draw arcs from the lower-level stereotypes to the root stereotype.



ADD DETAILS TO A STEREOTYPE

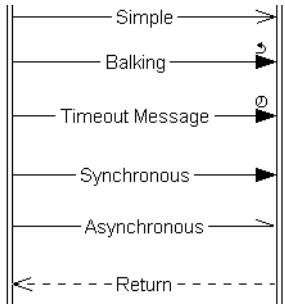
1. Select the stereotype.
2. Click **Properties** toolbar button or choose **Properties** on **Edit** or right-click menu.
3. To add an optional description, click **Description**, type the description in the **Object Description** window and click **OK**.
4. Add **Constraints** and / or **Tagged Values**, as desired; then click **OK**.

SEQUENCE EDITOR

ADD AN ACTOR TO A SEQUENCE DIAGRAM

1. From the Symbols toolbar, insert and label an actor symbol in the diagram.
2. From the Symbols toolbar, select an arc and left-click the mouse on the actor and its object to connect them.

CHANGE MESSAGE SYNCHRONIZATION TYPE IN A SEQUENCE DIAGRAM.



1. Select a message and choose **Edit** > **Replace**.
2. Select a message type and click **OK**.

ADD DETAILS TO MESSAGES IN A SEQUENCE DIAGRAM

1. Select a message and click **Properties** toolbar button or choose **Properties** on **Edit** or right-click menu.
2. Select options and enter or choose values on the **Properties** dialog; then click **OK**.
   Properties include: Predecessor Guard, Name Component, Message Sequence, Return Type, Message Recurrence, Message Arguments, Creation, Destruction, Stereotype, Constraints, and Tagged Values.

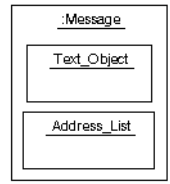
COLLABORATION EDITOR

GENERATE A COLLABORATION DIAGRAM

1. From the sequence diagram, choose **Go To** > **Collaboration Diagram** on the menu bar or right-click menu and click **OK** in the confirmation box.
2. Reposition the objects in the generated collaboration diagram as desired.

CREATE A COMPOSITE OBJECT

1. From the Symbols toolbar, select, insert and label a composite object symbol.
2. Insert and label or drag existing object symbols into the composite object, resizing the composite object as needed.
3. Select the arc symbol from the Symbols toolbar and draw arcs between the objects to show relationship.

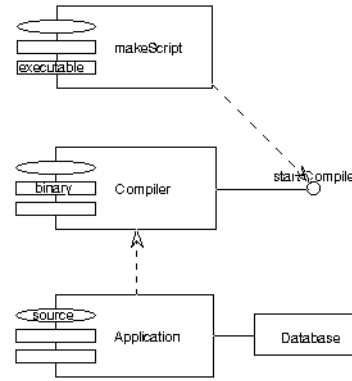


MAKE AN OBJECT ACTIVE OR PASSIVE

Select an object in the diagram and choose **UML** > **Make Object Active** or **UML** > **Make Object Passive**.

COMPONENT EDITOR AND DEPLOYMENT EDITOR

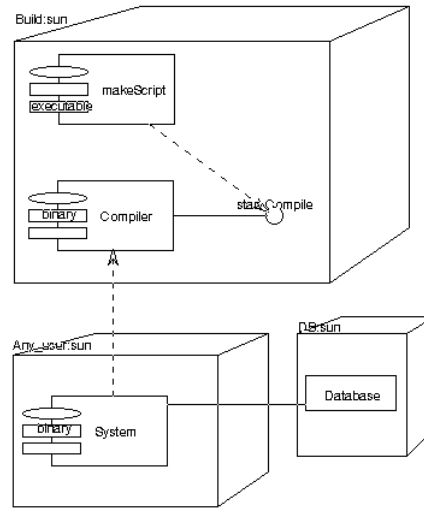
CREATE A COMPONENT DIAGRAM



1. From the Symbols toolbar, select, insert and label a source component symbol to represent the file containing the root of a program.
2. Insert and label binary component symbols to represent compiled source code.
3. Insert executable component symbols to represent non-binary executable files.
4. Insert object component symbols to represent objects important to the implementation of the model; link each to its host component with an Is Component Of arc.
5. Insert interface components to represent the visible behavior of a binary or executable component (link each to its host component with an interface arc).
6. Draw dependency arcs from one component to another (or to its interface).

GENERATE A DEPLOYMENT DIAGRAM FROM A COMPONENT DIAGRAM

1. Choose **Go To** > **Deployment Diagram**.
2. When asked to confirm, click **OK**.



ADD DEPLOYMENT NODES

1. From the Symbols toolbar, select and insert a deployment node symbol into the drawing area.
2. Choose **Edit > Choose deploymentComponent Names** or type a label in one of these formats:
   - node type, e.g. **`HostMachine`**
   - node name:node type, e.g. **`Owl:HostMachine`**
3. Scale the node symbol to fit its components.

SHOW HARDWARE DEPENDENCIES IN A DEPLOYMENT DIAGRAM

To indicate a dependency between deployment nodes, draw a connection from a component in one of the nodes to a component in the other node