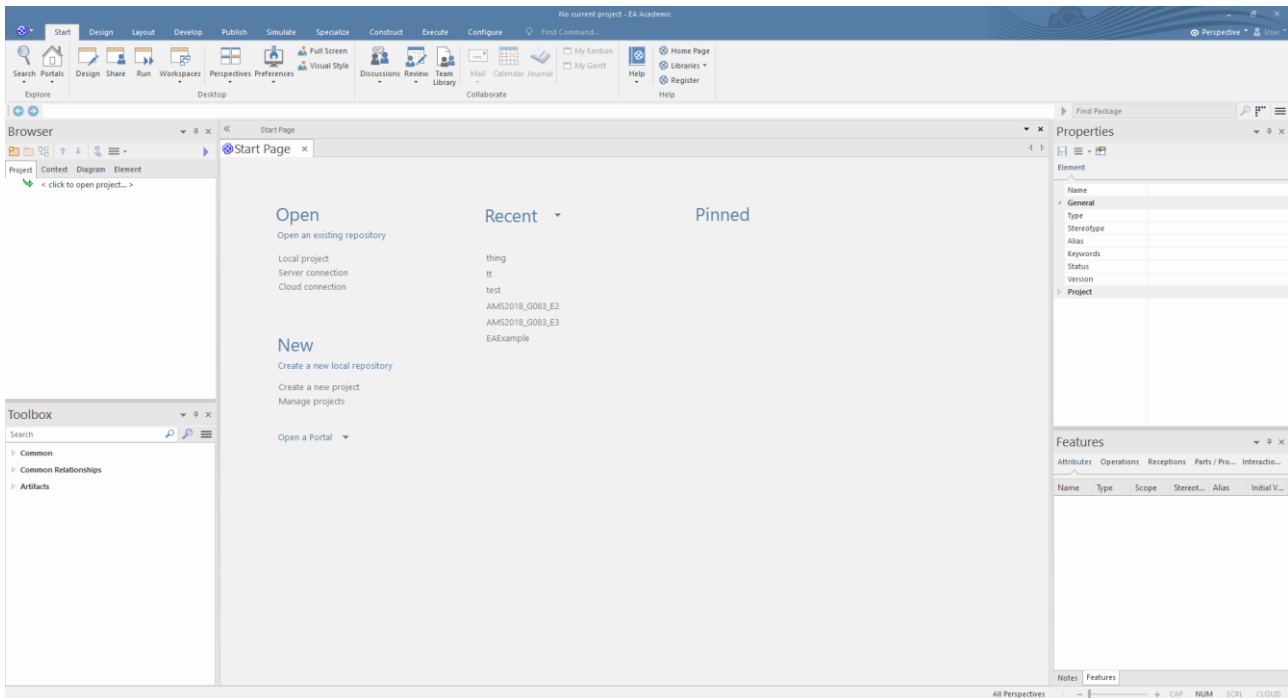


Basics

Note that there are multiple ways to do these things within the program, this guide merely shows some.

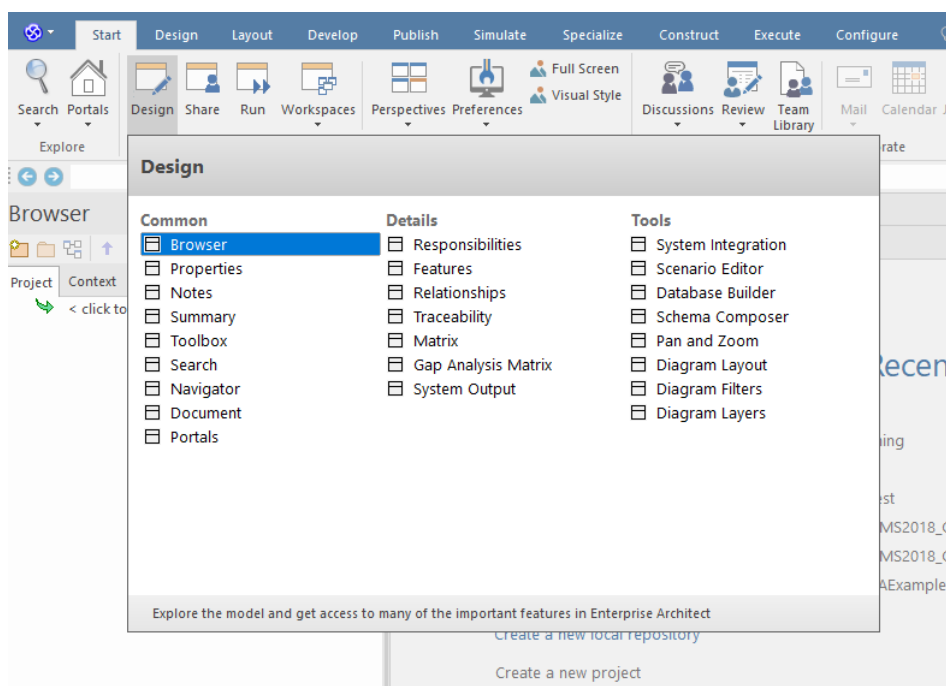
EA options

During this guide certain tabs will be used to add or edit element, change settings, etc. This is what the application window that will be used looks like



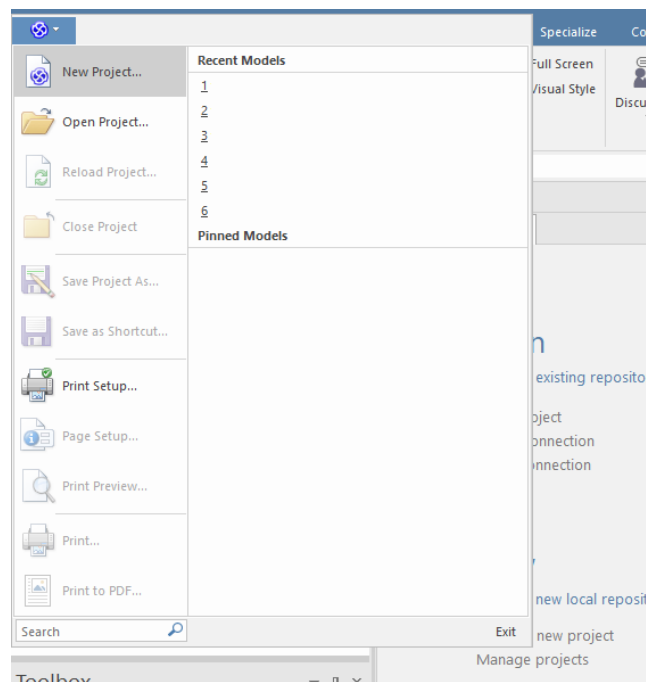
To turn on each of these tabs you go to Start -> Design and then choose the ones you want.

The ones being used are Browser, Toolbox, Properties and Features. You can drag them around into different positions, add them as tabs to the same section of the window etc. Customize your UI as you prefer.



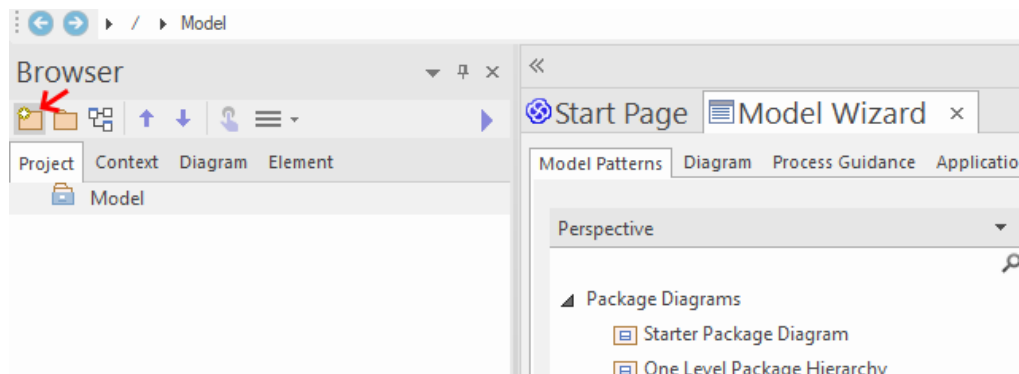
New projects


To create a project you can click the EA symbol on the top left corner and select New Project



Once you have saved the file you can add as many models as you want using the Model Wizard

You can access the Model Wizard with the option shown in the picture:

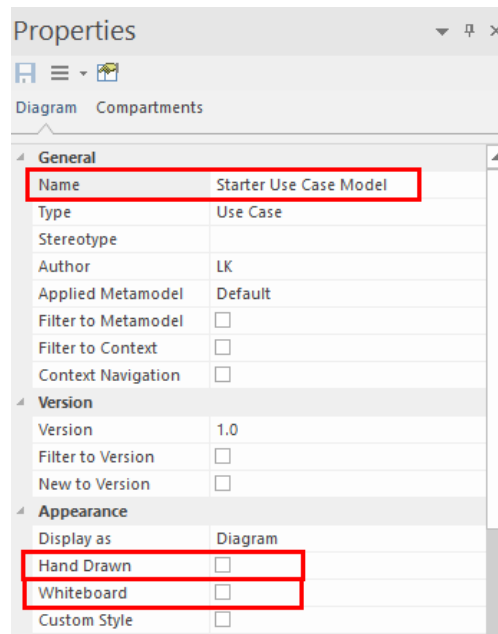


You can also right-click  Model and select Add a Model using Wizard.

This will show the Model Wizard next to the Start Page, you select that tab and choose which Model you wish to add. Note that the Model will be added to the selected section in the browser (if you have another Model selected the new one will be created inside it, usually you just select the root of the tree).

Properties & Features

When you have a diagram open but you are not selecting anything within it the properties tab will show options for the diagram itself that you can edit. Of particular note are the name of the diagram and the ability to toggle Hand Drawn and Whiteboard.

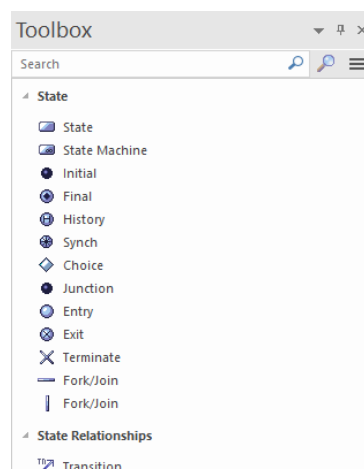


While Hand Drawn and Whiteboard are both merely style choices, Whiteboard can improve the readability of diagrams where colour adds nothing and Hand Drawn can be quite annoying if you like your diagrams with straight lines.

When you select anything the Properties and the Features sections will display the available information for the selection. You can always edit an element's name in this tab when you select it.

Adding Elements

All possible elements for the opened diagram are available in the toolbox, you can add them by dragging them in. Example from the State Machine Diagram:

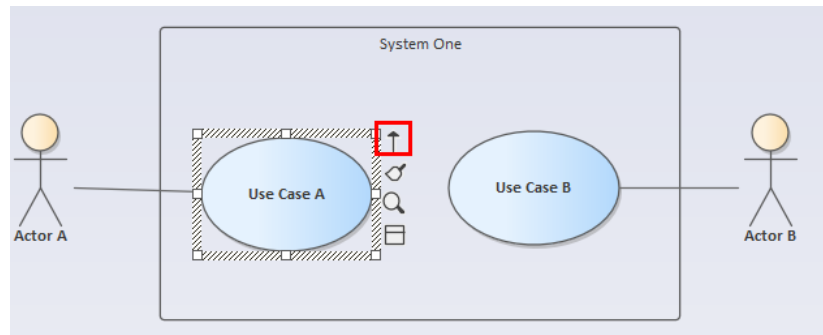


If it is an element that is inside of another you must drag and drop inside the element. Ports for the Internal Block Diagram or sub-states in the State Machine Diagram for example.

Adding Connectors

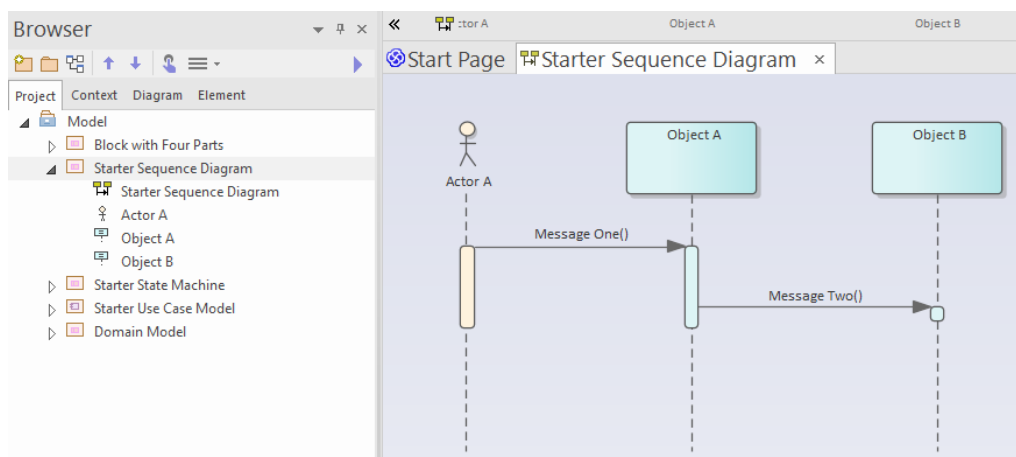
There is a small detail for connectors, let us take the Use Case Diagram as an example.

Whether you add a relationship from the toolbox or use the connect option (see next figure), you always have to click the origin and hold down the mouse button while you drag to the destination. If you drag to an empty space you get a prompt to add a new element.



Keeping track of the Elements

All elements on the diagrams are visible on the tree in the browser, you can add them to the diagram by dragging (in case you delete them). Example from the Sequence Diagram



Use Cases

Adding the Model

Searching by Use Case (or scrolling down to it) you can select the pattern that is closest to what you need or just the basic one.

The screenshot shows the 'Model Wizard' window with the 'Use Case' perspective selected. The 'Starter Use Case Model' is highlighted in the list of patterns. The main area displays the 'Starter Use Case Model' diagram, which shows a system boundary labeled 'System One' containing two use cases, 'Use Case A' and 'Use Case B'. Two actors, 'Actor A' and 'Actor B', are connected to the use cases. The diagram is titled 'Starter Use Case Model'.

The Starter Use Case Model pattern creates elements and a Use Case diagram that describes the goals that user roles wish to achieve from the system. The Use Cases are all contained within the System Boundary and the Actors all lie outside the Boundary.

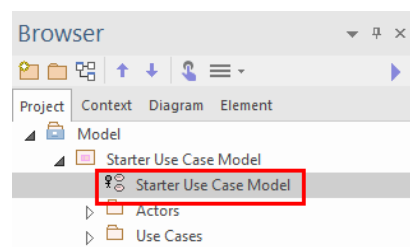
Figure 1. Shows a Use Case diagram with Actors and a number of Use Cases enclosed in a System Boundary.

Discussion

The purpose is to allow Business Analysts and other stakeholders to describe the value that Actors (the roles that users play) want to achieve when interacting with the system.

The pattern is typically used in the analysis phase of an initiative and can be used to realize any number of Requirements

Create Pattern(s) Add To: Model ☐ Customize Pattern on import ☐ Combine with selected Package



The diagram is this element:

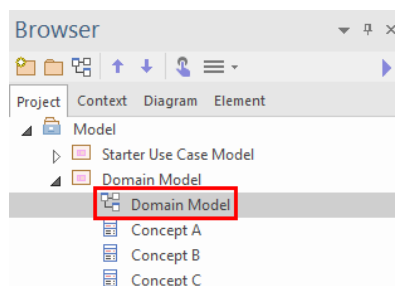
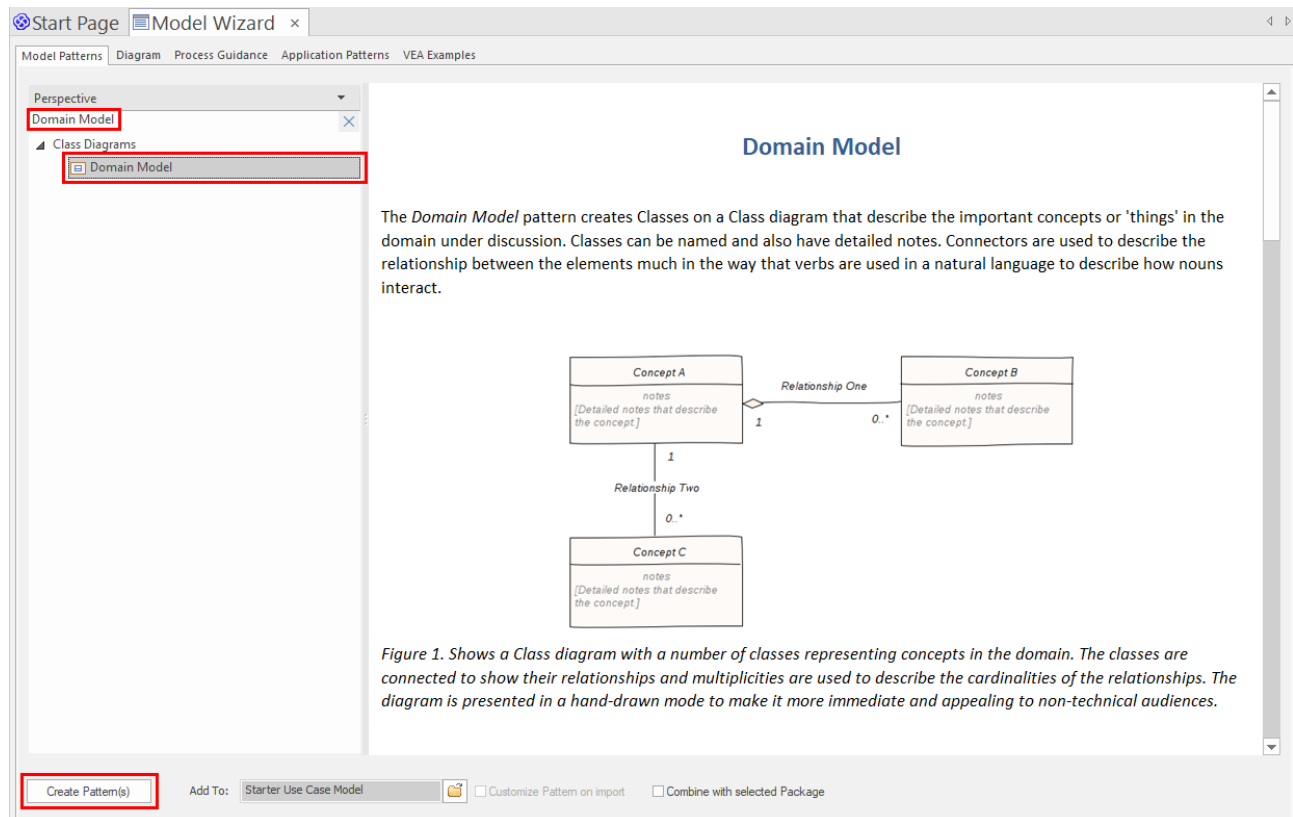
Element details

No element has any detail beyond what was outlined in the basics.

UML – Domain Model

Adding the Model

Searching by Domain Model (or scrolling down to it) you can select the pattern for Domain Model.



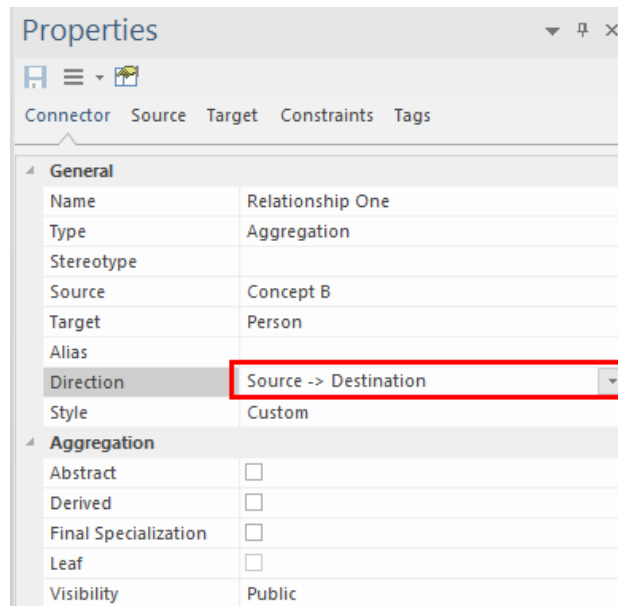
The diagram is this element:

This diagram comes with Hand Drawn by default

Element details

Relationships

The Relationships can be re-oriented in their properties:

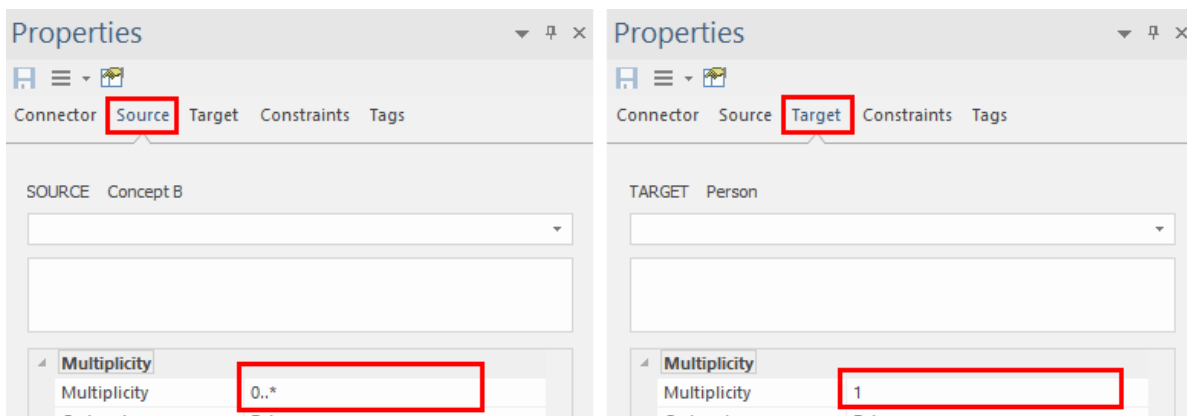


The Properties dialog for a Relationship One is shown. The 'General' tab is active. The 'Direction' dropdown is set to 'Source -> Destination' and is highlighted with a red box.

General	
Name	Relationship One
Type	Aggregation
Stereotype	
Source	Concept B
Target	Person
Alias	
Direction	Source -> Destination
Style	Custom

Aggregation	
Abstract	<input type="checkbox"/>
Derived	<input type="checkbox"/>
Final Specialization	<input type="checkbox"/>
Leaf	<input type="checkbox"/>
Visibility	Public

You can edit the multiplicity in the Source and Target tabs of the Properties:



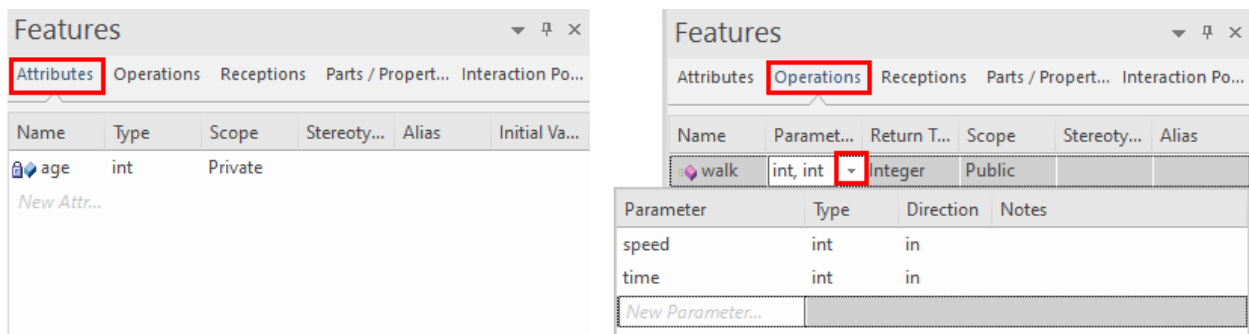
Two screenshots of the Properties dialog are shown. The left screenshot shows the 'Source' tab with the 'Multiplicity' dropdown set to '0..*' and highlighted with a red box. The right screenshot shows the 'Target' tab with the 'Multiplicity' dropdown set to '1' and highlighted with a red box.

Source	
Source	Concept B
Multiplicity	0..*

Target	
Target	Person
Multiplicity	1

Classes, Enumerations and Data Types

When these are selected you view/edit/add/delete Attributes and Operations in the respective tabs within the Features. Within an Operation you can view/edit/add/delete its parameters:



Two screenshots of the Features dialog are shown. The left screenshot shows the 'Attributes' tab with a table of attributes. The right screenshot shows the 'Operations' tab with a table of operations and their parameters.

Name	Type	Scope	Stereotype	Alias	Initial Value
age	int	Private			
New Attr...					

Name	Paramet...	Return T...	Scope	Stereotype	Alias
walk	int, int	Integer	Public		
New Parameter...					

Parameter	Type	Direction	Notes
speed	int	in	
time	int	in	

UML – State Machine Diagrams

Adding the Model

Searching by State Machine (or scrolling down to it) you can select the pattern that is closest to what you need or just the starter one.

Starter State Machine

The *Starter State Machine* Pattern describes an entity (e.g. Class, Actor, Use Case or Test Case) from the point of view of the important states that it exhibits. The State Machine diagram indicates that the entity can be in one of two states and it transitions between the two states.

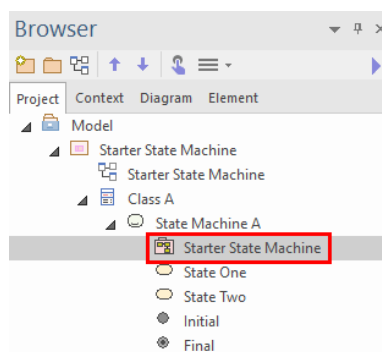
Figure 1. A state machine diagram showing two states and two transitions and an initial Pseudostate and a Final State.

Discussion

To provide a mechanism to represent the conditions (States) a System Engineer or other Stakeholder thinks are important in the lifetime of a Class or other element. It describes the state dependent behavior showing how the element transitions from state to state.

The pattern is used when a Software Engineer want to define or describe a set of discrete states a Class or other Element may exhibit. They are typically created to analyze the behavior of some part of the system often because it is difficult to understand or because its behavior is complex.

Create Pattern(s) Add To: Model ☐ Customize Pattern on import ☐ Combine with selected Package



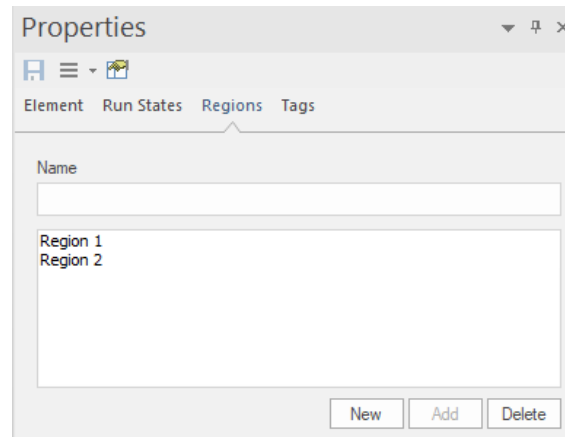
The diagram is this element:

Element details

Composite States

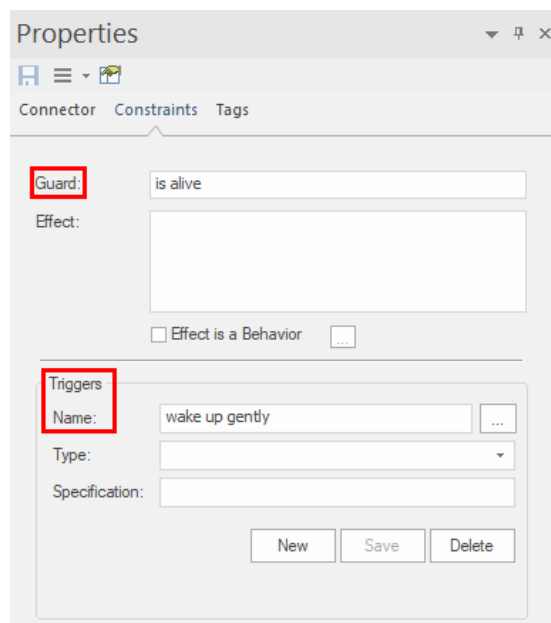
As mentioned you simply need to drag a state into another, whether it is a new one from the toolbox of an already existing one. You can resize each state to fit what you need.

If you wish to define regions within the composite state, you can do so in the Regions tab of Properties:

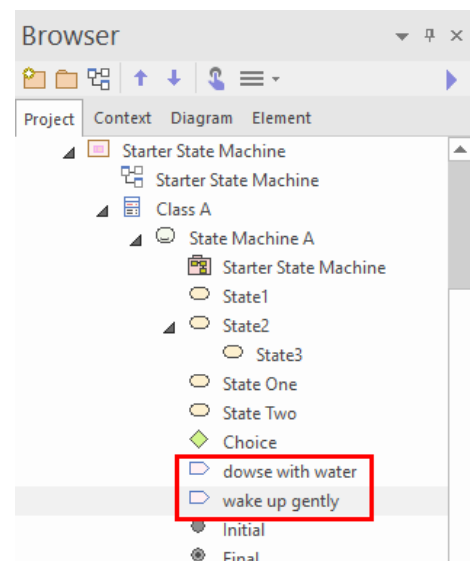


Transitions

You can edit the Guard and the Trigger in the Constraints tab of Properties:



If you create multiple triggers for a Transition you can still edit them all by selecting the desired one in the Browser:



Sequence Diagrams

Adding the Model

Searching by Sequence Diagram (or scrolling down to it) you can select the pattern that is closest to what you need or just the starter one.

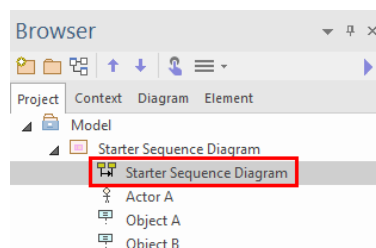
Starter Sequence Diagram

The *Starter Sequence Diagram* pattern creates elements and a Sequence diagram that describes the interaction of an Actor and two Components showing the time ordered calling of messages. The return messages are not explicitly shown in this diagram.

Figure 1. Shows a Sequence diagram and the interaction of an Actor and two Components and the messages they exchange.

Discussion

The purpose is to allow the interaction between the elements to be visualized. Designers and Implementations teams typically create the Sequence diagrams either as a design tool or for the purposes of documentation. The pattern allows a



The diagram is this element:

Element details

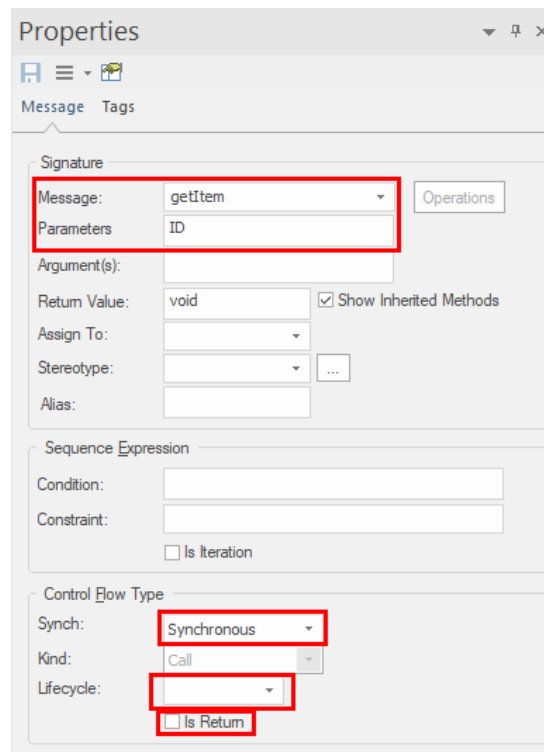
Actors and Lifelines

There have no special options, note that when you add them they are always lined up at the start point of the diagram.

Messages

These control the look of the diagram.

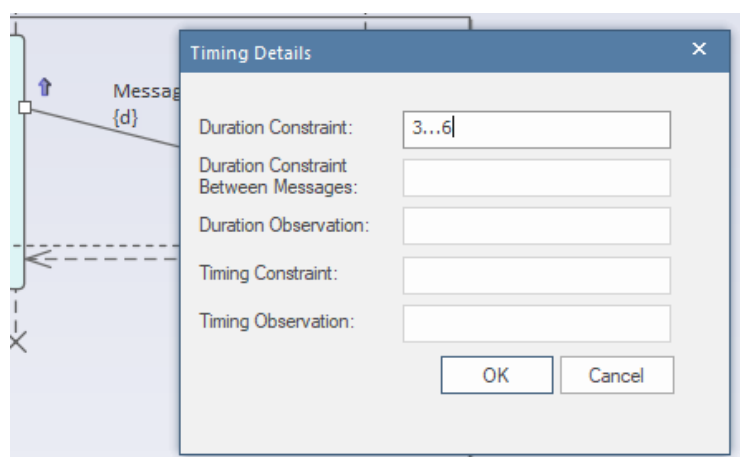
As it relates to the look of the message itself you can define whether it is a Return or not, whether it is Synchronous or Asynchronous and its name and parameters



The image shows the 'Properties' window for a UML Message. The 'Message' tab is selected. The 'Signature' section contains the following fields: 'Message:' with a dropdown set to 'getItem', 'Parameters' with a text field containing 'ID', 'Argument(s):' with an empty text field, 'Return Value:' with a dropdown set to 'void', and a checked 'Show Inherited Methods' checkbox. The 'Sequence Expression' section has 'Condition:' and 'Constraint:' text fields, and an unchecked 'Is Iteration' checkbox. The 'Control Flow Type' section has 'Synch:' with a dropdown set to 'Synchronous', 'Kind:' with a dropdown set to 'Call', 'Lifecycle:' with a dropdown set to 'New', and an unchecked 'Is Return' checkbox. Red boxes highlight the 'Message:' dropdown, the 'Parameters' text field, the 'Synch:' dropdown, the 'Lifecycle:' dropdown, and the 'Is Return' checkbox.

But beyond that you can also control the lifecycle of the target lifeline. If you select New in Lifecycle then this will become a creation message, if you select Delete this will become a destruction message. The lifeline will adjust accordingly, moving the Object/Actor down or adding the X.

If you want to represent a delay for a message you can right click it and select Timing Details. Fill out the Duration Constraint field and the message will now be non-instantaneous.



The image shows the 'Timing Details' dialog box for a UML message. The 'Duration Constraint' field is filled with '3...6'. The other fields are empty: 'Duration Constraint Between Messages:', 'Duration Observation:', 'Timing Constraint:', and 'Timing Observation:'. The 'OK' and 'Cancel' buttons are at the bottom right. In the background, a UML diagram is visible with a message arrow and a lifeline.

If you wish to reorder messages or drag into/out of fragment pay attention to the tooltip:

Use Shift or Alt or Enable Reorder Messages from Layout

Fragments

In the Combined Fragment tab of Properties you can select the type of fragment, add a name if needed and defined conditions if needed.

The screenshot shows the 'Properties' dialog box with the 'Combined Fragment' tab selected. The 'Type' dropdown is set to 'alt'. The 'Name' field is empty. The 'Interaction Operands' section contains a 'Condition' field and two sub-conditions, 'Condition 1' and 'Condition 2'. The 'Delete', 'New', and 'Save' buttons are at the bottom.

Properties

Element **Combined Fragment** Tags

Type: alt

Name:

Interaction Operands

Condition

Condition 1

Condition 2

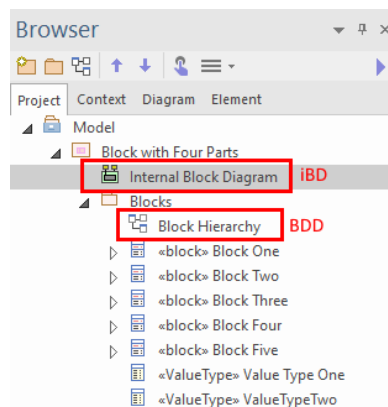
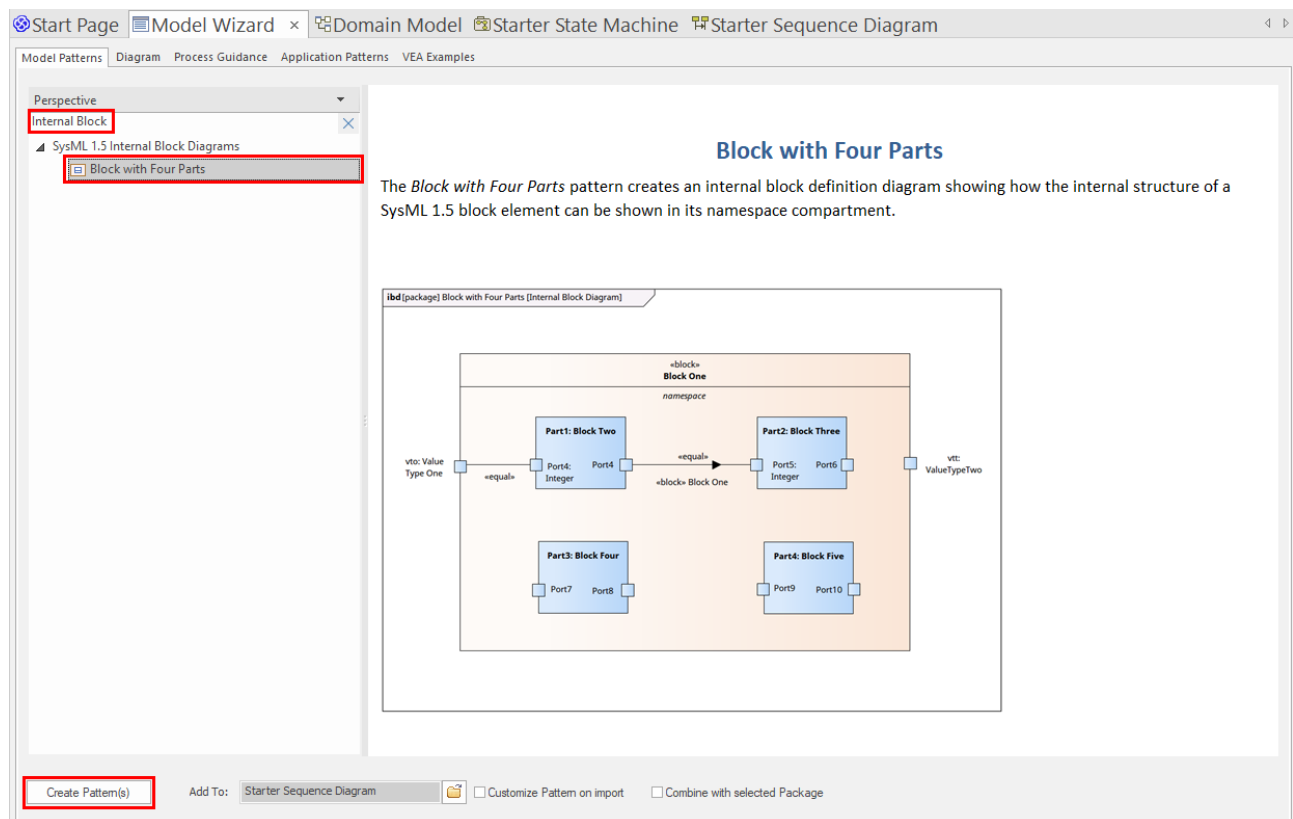
Delete New Save

BDD & iBD

Adding the Model

This one is a special case, by adding the iBD model you also get a BDD diagram.

Searching by Internal Block (or scrolling down to it) you can select the pattern for Block with Four Parts.



The diagrams are these elements:

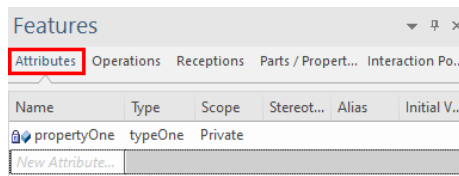
Element details

Since we are dealing with two diagrams at once, after you drag in a new element you will have to use the Browser to add some of them to the other diagram.

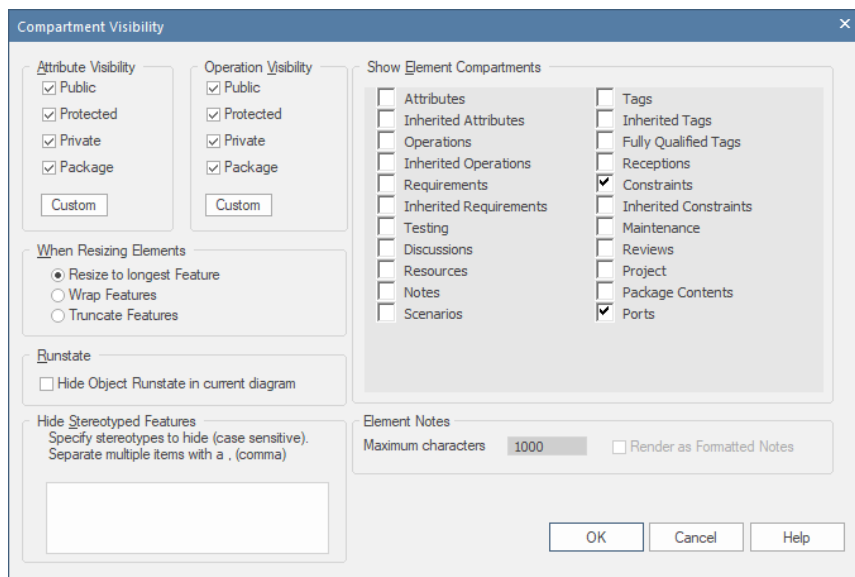
Blocks

New Blocks are added in the BDD, once a block is added it will be visible in the Browser and can be added to the IBD by dragging and dropping it from there.

As in the Domain Model, you can view/edit/add/delete Attributes in the Attribute tab of Features:



In order to select what each Block displays in the BDD you can right-click it and select Compartment Visibility....:

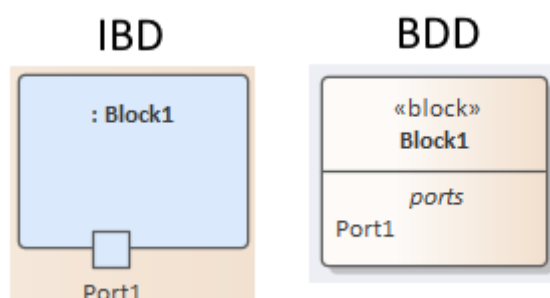


Ports

For this section it is assumed that the Block you are adding a Port for is already in both diagram and that the ports are set as visible in the Compartment Visibility.

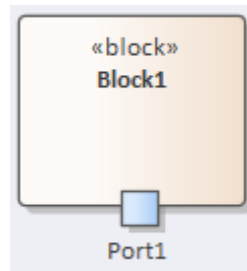
Option 1:

Add the port in the IBD diagram by dragging and dropping a Port from the toolbox into the middle of the Block. You can drag the port around afterwards to the position you prefer. The port appears automatically in the BDD diagram.

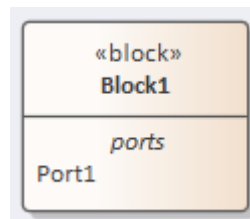


Option 2:

Add the Port in the BDD diagram by dragging and dropping a Port from the toolbox into the middle of the Block. The Port will look like this:



Select the Port (the blue square) and press delete, the Port will now appear in the port section of the Block:



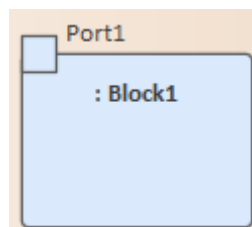
Now on the IBD this new port will not be visible:



Select the Block and in the Interaction Points tab of the Features you can toggle the Port as visible:

Features					
Attributes Operations Receptions Parts / Properties Interaction Points					
Name	Element	Type	Stereotype	Visible	Owner
<input type="checkbox"/> Port1	Port			False	Block1

Once you do you will get the port as desired in the IBD:



Connectors

As seen before you can edit the multiplicity in the Source and Target tabs of Properties:

