Using the Action Diagram in Innoslate®

This document discusses how to use the Action Diagram in Innoslate.

Contents

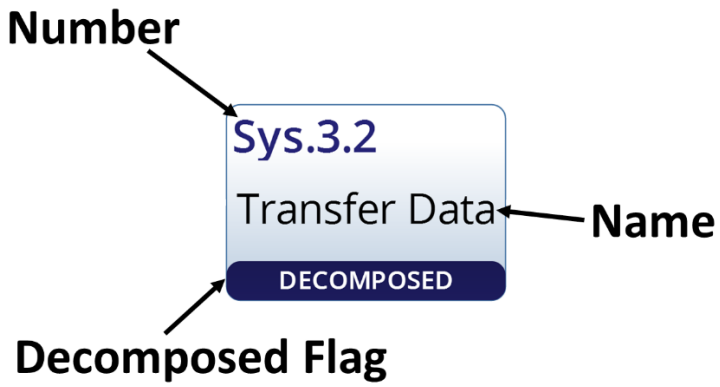
Overview

The Action Diagram is a method of displaying Actions, their interactions via Input/Outputs & Resources, and logic flow. The Action diagram is read starting at the "Start" construct then following the arrow lines Actions are performed until the "End" construct is reached. The Action Diagram supports 8 diagram elements: a simple Action, a Parallel construct, an OR Action, a SYNC Action, a LOOP Action, an Input/Output, Branch Asset, and Resources. Each of these 8 elements are unique and when combined together provide the necessary functional logic needed for a model. Each diagram element is described in more detail below.

Action Diagram Elements

Basics

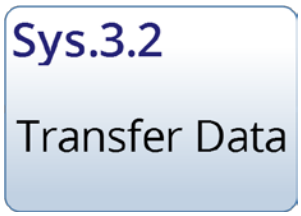
The simple, OR, LOOP, and SYNC Actions all have a common text layout structure. The Action's number will appear in the top left, the Action's name will appear in the center, and if the Action has decomposition a "DECOMPOSED" flag will be displayed on the bottom.



Start & End

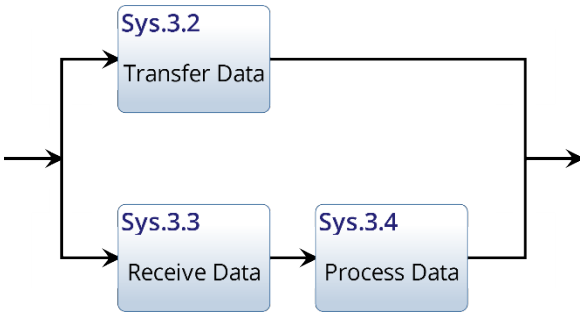
The Start construct indicates where the functional logic initiates for this diagram, while the End construct indicates the termination of this diagram. The Start & End constructs have no duration and are just used as visual indicators for the flow of the Action Diagram.

Simple Action



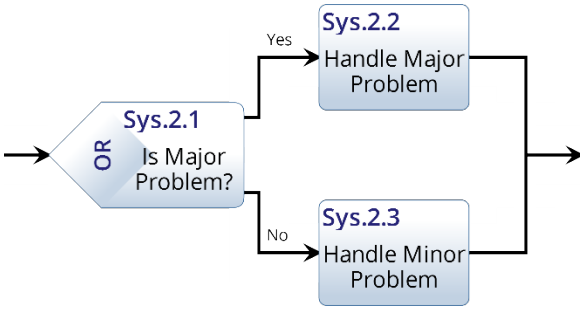
The simple Action has no unique diagram properties and is the basis of most Action Diagram.

Parallel



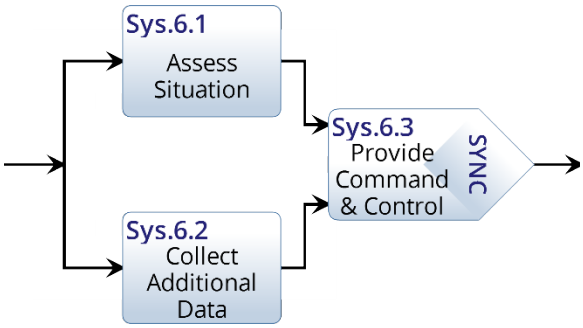
A parallel construct allows two or more actions to be perform at the same time. Each path is unique and all paths happen at the same time during simulation. The point where the arrow lines disperse is the start of an individual parallel branch and the point where the arrow lines converge is the end of the Parallel.

OR



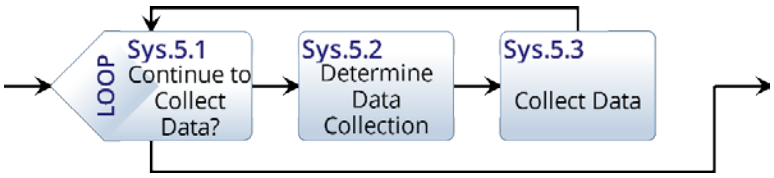
ORs are an Actions that have two or more potential exit paths. Each exit path is unique and only one path may happen during simulation. The point where the exit path's arrow lines converge is the end of the OR's paths.

SYNC



SYNCs are a powerful merger of a parallel diagram element and an Action. Syncs can be used to control timeouts of the Action inside the SYNC's parallel paths. Each path is unique and all paths happen at the same time during simulation. The point where the arrow lines disperse is the start of an individual SYNC branch.

LOOP



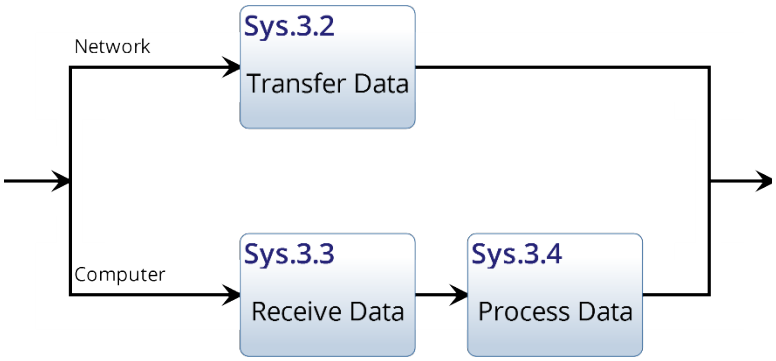
LOOPs are Actions that will repeat the Actions that immediately follow on the LOOP Action's continue path. The final Action on the LOOP's continue path will have arrow line pointing back to the LOOP Action indicating that the Exit arrow line path is to be followed.

Input/Output

The Input/Output is a functional representation of data that is passed between Actions. The Input/Output is generated by at least one Action and is then received by at least one other Action.

If an Input/Output's received by (relationship between Input/Output and an Action) Trigger value (attribute on the relationship) is set to false the Input/Output will show up as grey on the diagram. When the received by Trigger value is set to true the Input/Output will show up as green on the diagram. The distinction between these is to visually indicate when reading the diagram if an Action needs to wait for a given piece of data (represented by the Input/Output) before the Action can be performed.

Branch Asset



Branch Assets are Assets that perform the Actions on the parallel's branch. This provides a way to visualize swim lanes.

Resource

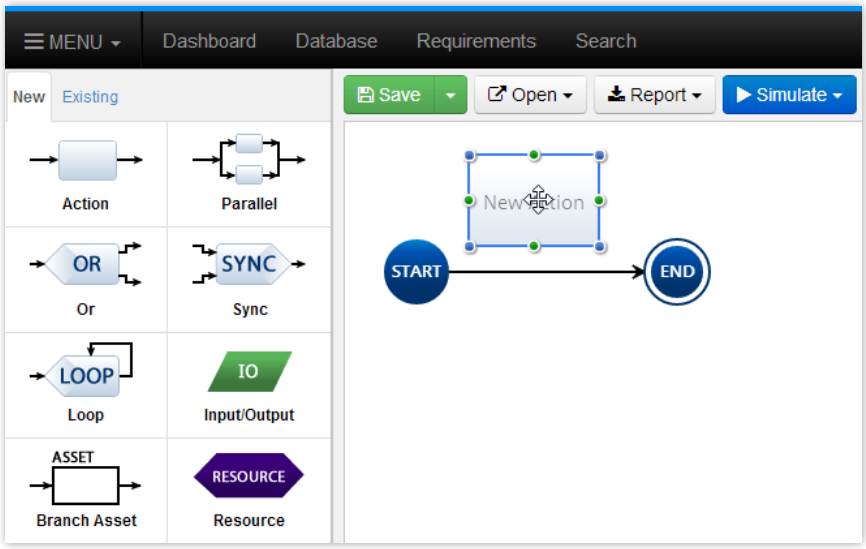
Resources are the representation of a physical object that are consumed, produced, or seized by Actions. Resource are produced by Actions and consumed by Actions.

If a Resource is seized by an Action the Resource will show up in a muted color. If a Resource is consumed by an Action the Resource will show up as show above. The distinction between these is to visually indicate when reading the diagram if an Action consumes or seizes a given Resource.

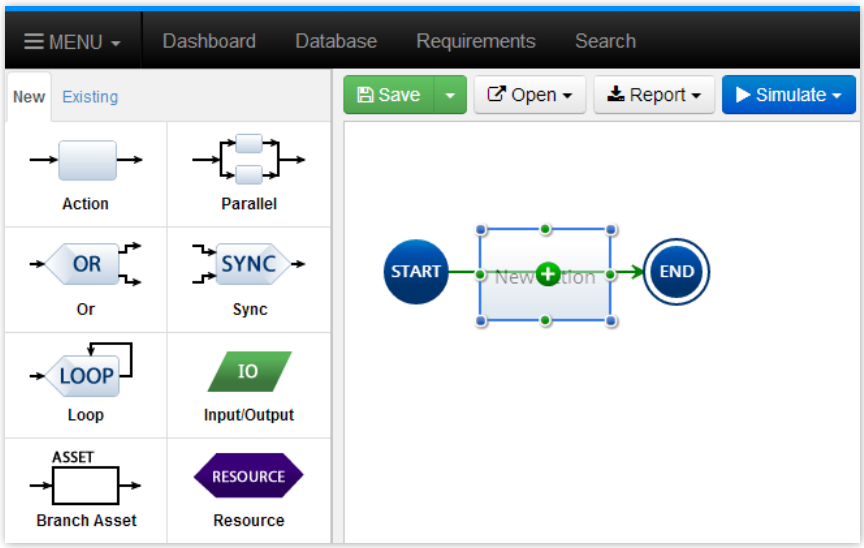
Interaction

Adding an Action

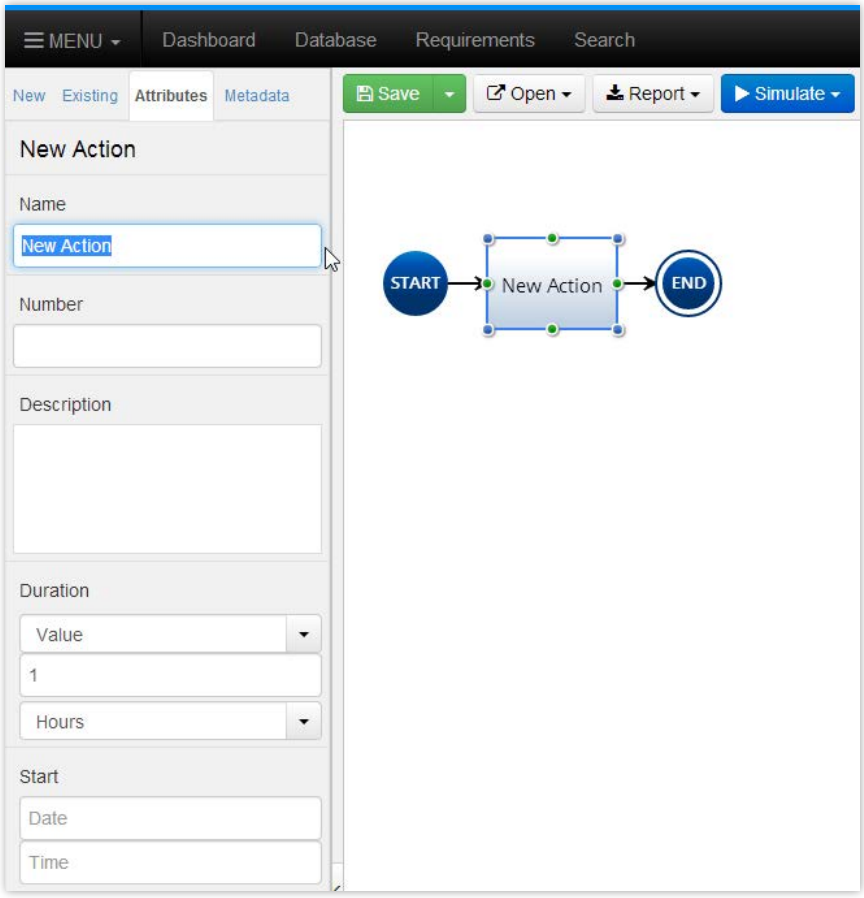
To add an Action to the diagram, select the type of Action you want to add (Action, LOOP, OR, SYNC) then drag that Action onto the line between the Start and End.



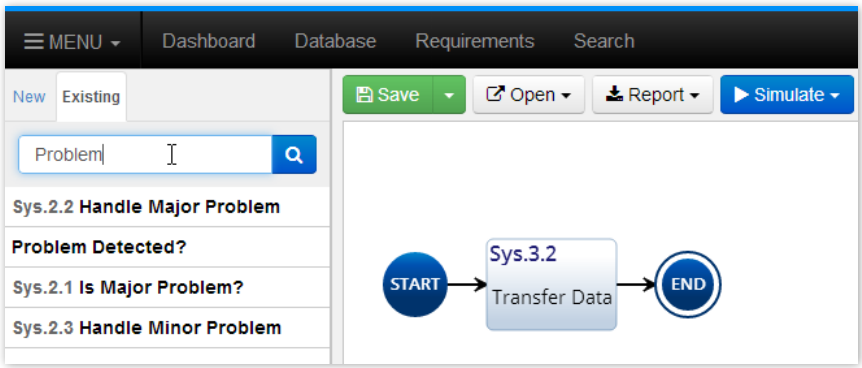
The line will turn green when you can drop the Action into place.



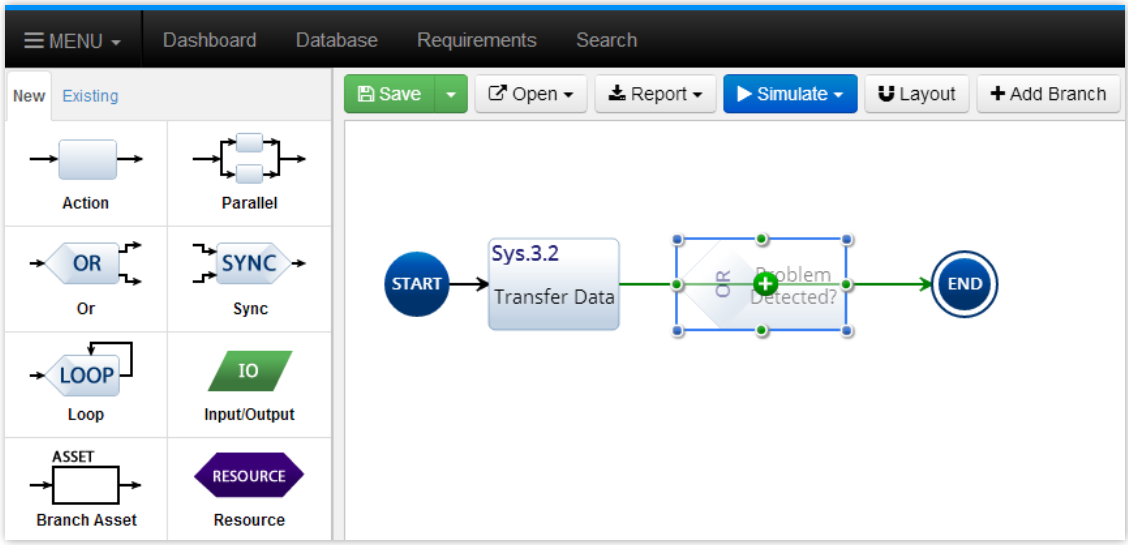
The Action is already populated with a default name of “New Action”. Rename the Action by selecting the Action and adding a new Name, Number, Description, Duration, and other properties in the side bar.



To add an existing Action select “Existing Entities” from the side bar. Here search for your name of the entity.



Then click and drag the Action over onto the green line as above. The Action will carry over the diagram logic from the previous diagram.

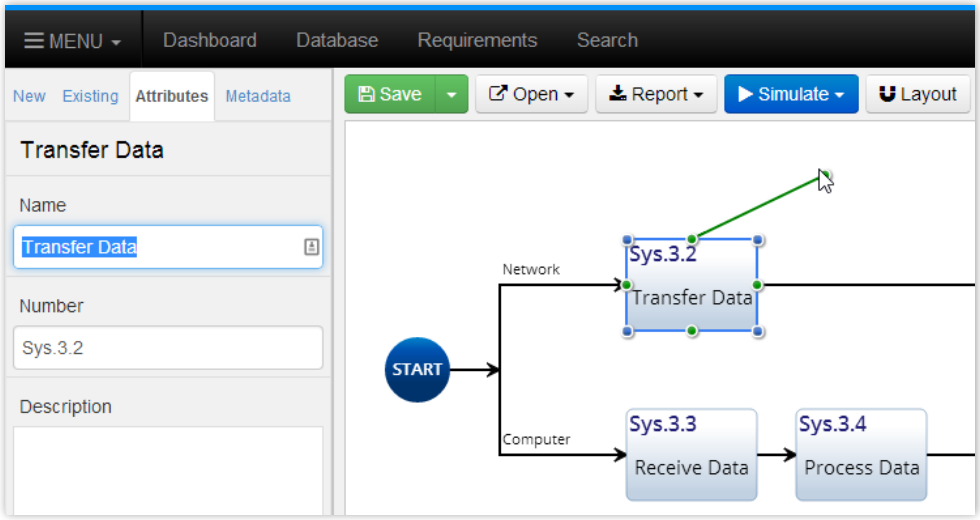


Note: You cannot have an Action have two different diagram logics in two different diagrams. Example: A LOOP Action CANNOT also be an OR action on a different diagram.

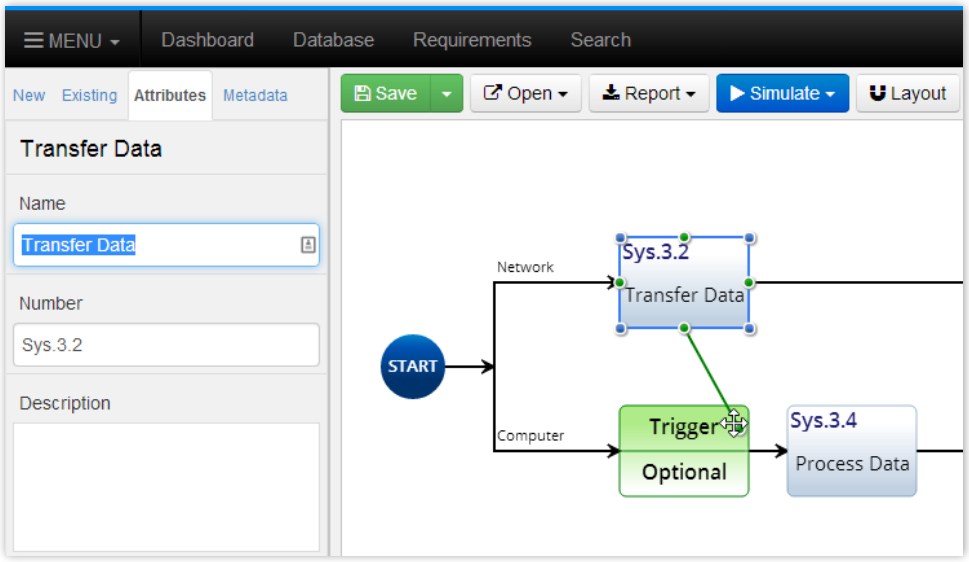
Adding Input/Outputs

There are a couple ways of adding Input/Outputs to the Action diagram. The first two ways is to utilize the green dots located on the top, bottom, left, and right of an Action.

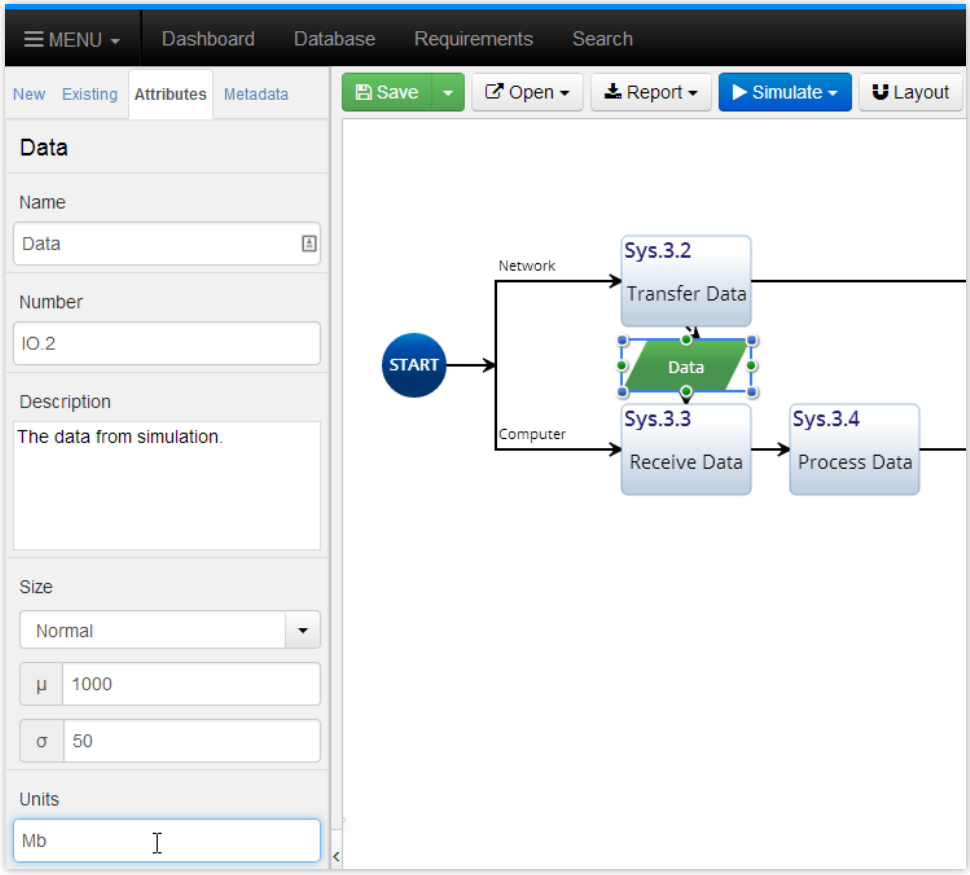
By clicking and holding then dragging that green dot will cause a green line to be drawn connecting to the mouse pointer.



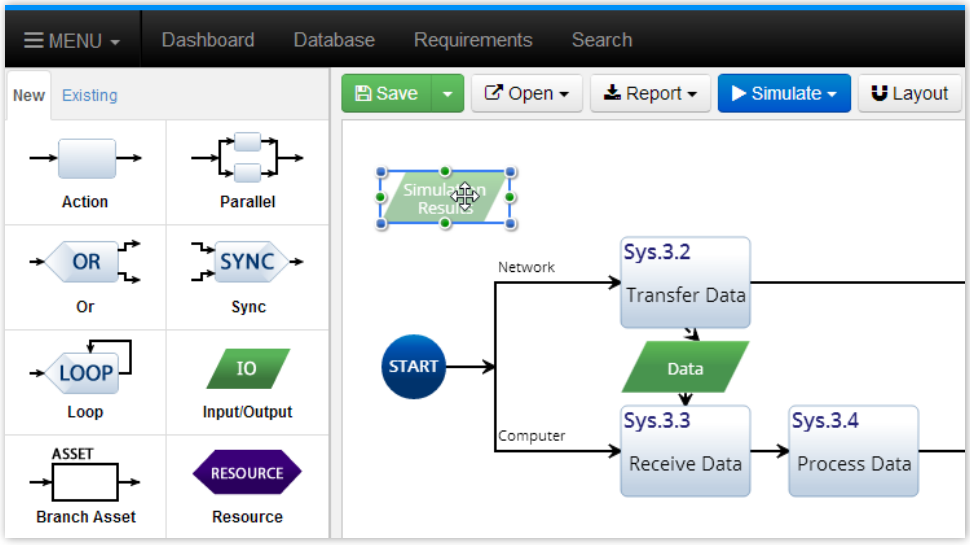
Releasing the green dot over the white canvas area will cause a new Input/Output to be created with the generated relationship automatically added. Otherwise, moving the green dot over another Action will turn the second Action green as shown below. Releasing the green dot over the "Trigger" part will create a new Input/Output and automatically add the generated by and received by relationships and set the Trigger attribute on received by to True. Releasing over the "Optional" part will also create a new Input/Output and set the relationships, but will set the Trigger attribute on received by to False.



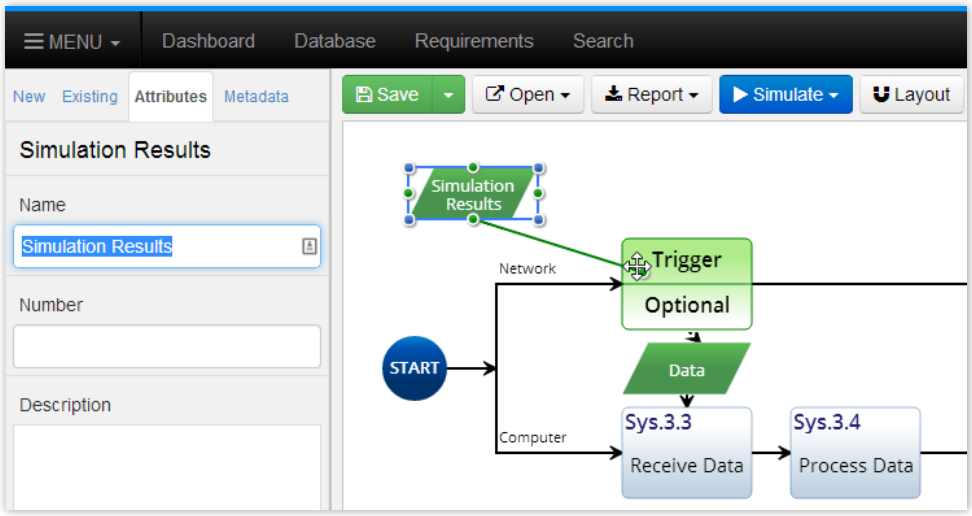
Rename the Input/Output by filling in the information on the side panel.



The third way to add Input/Outputs is to use the "Existing Entities" Tab. Search for the name of the Input/Output, then click and drag the Input/Output over and drop onto the diagram.

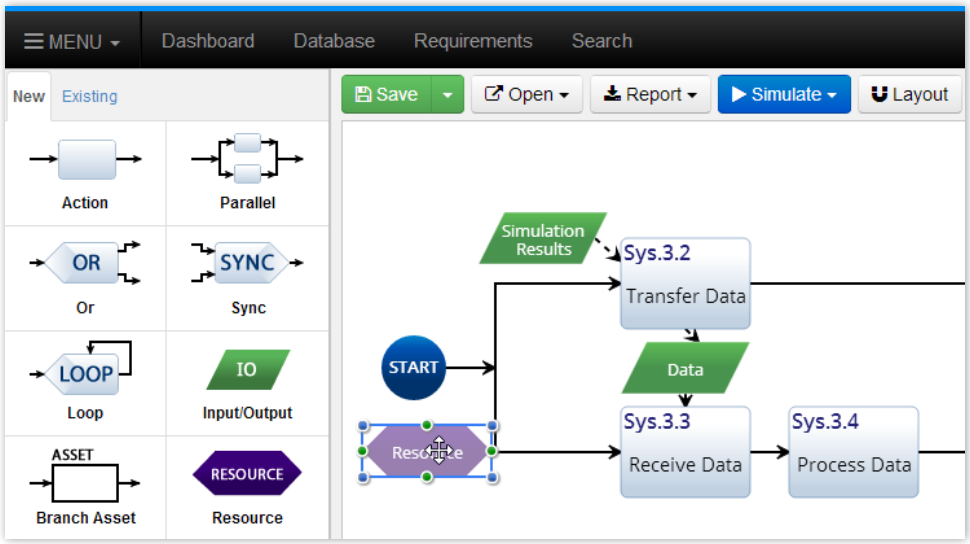


To connect Actions to the Input/Output, select the Action to generate the Input/Output and drag a green dot onto the Input/Output as above. To connect an Input/Output to an Action via the received by relationship, select the Input/Output and drag a green dot onto an Action as above.

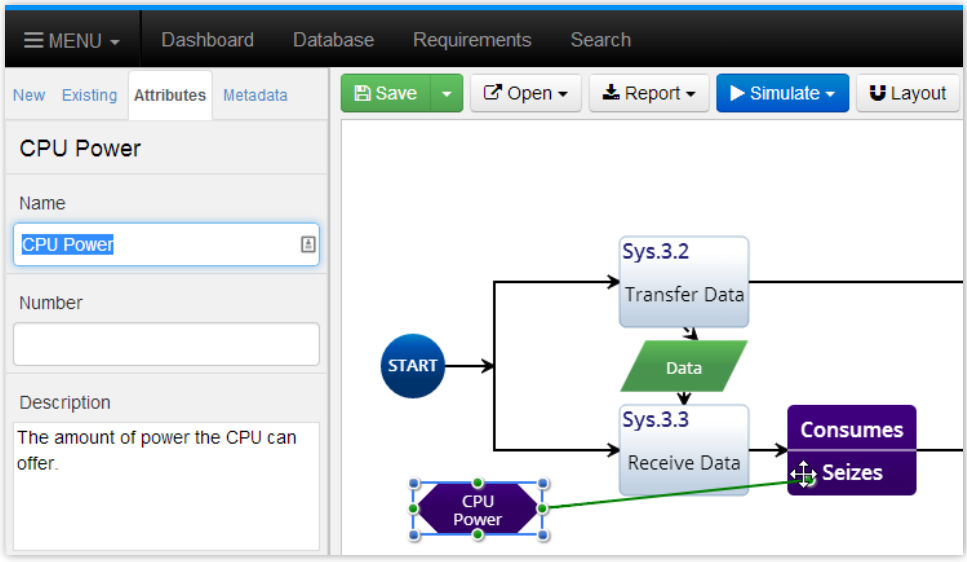


Adding Resources

To add a Resource, first drag a Resource from the side panel via the New tab or the Existing tab.



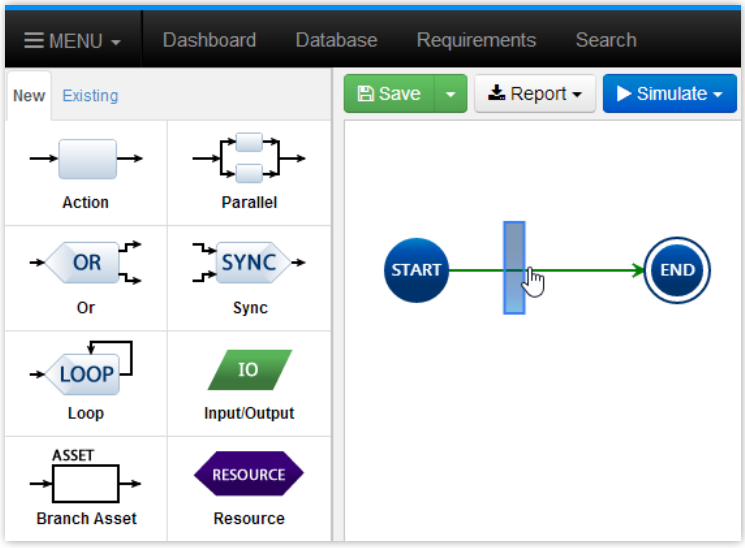
Release the Resource over the canvas to add it to the diagram. Then using the green dots, as described above, release the green dot over the Action to add the appropriate relationship.



Releasing over "Consumes" will automatically add the consumed by/consumes relationship, while "Seizes" will automatically add the seized by/seizes relationship.

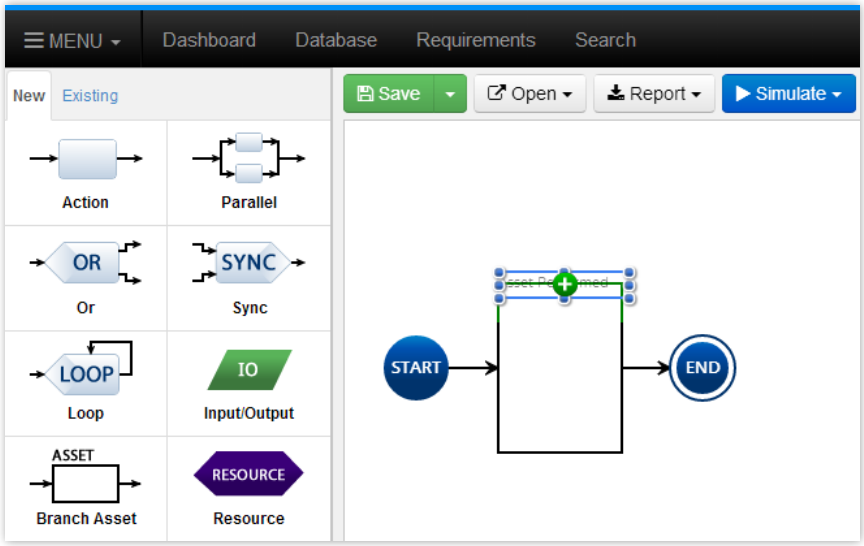
Adding Parallels

To add a parallel construct to the diagram, drag the parallel from the side bar and hover over the desired location. The line segment will turn green when you can place the parallel construct.



Adding Branch Asset

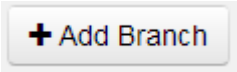
To add a Branch Asset, drag a branch Asset over from the side panel. When the desired Parallel's Branch turns green, release the Branch Asset.



Use the side panel to then modify the name, number, and description of the Asset.

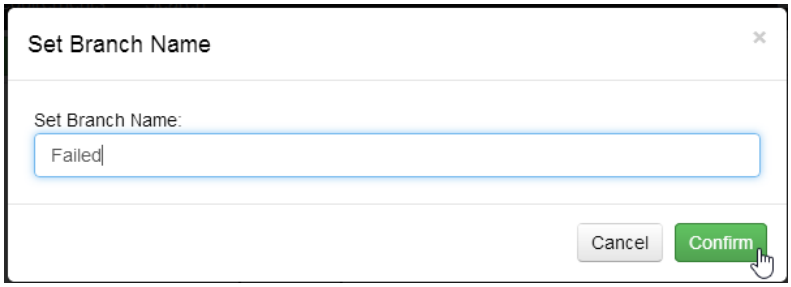
Adding Parallel, OR, or SYNC Branches

To add a branch select the diagram element. A button will appear in menu bar called "Add Branch", select the button to add another branch to the diagram element.



Renaming an OR or LOOP Branch Name

To rename a branch label name, double click on the branch name. In the pop-up enter the desired name and then select "Confirm".

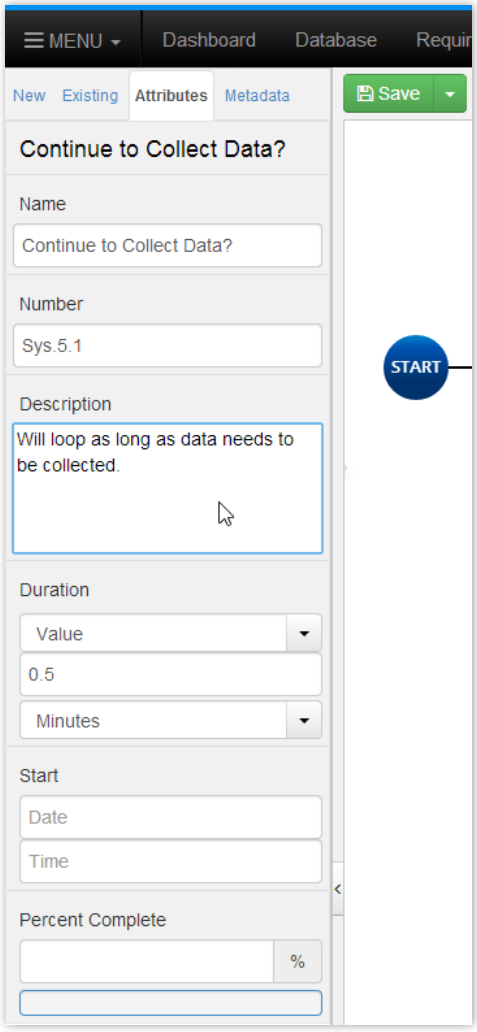


Removing a Parallel, OR, or SYNC Branch

To remove a branch, select the branch and then click the "Remove" button.

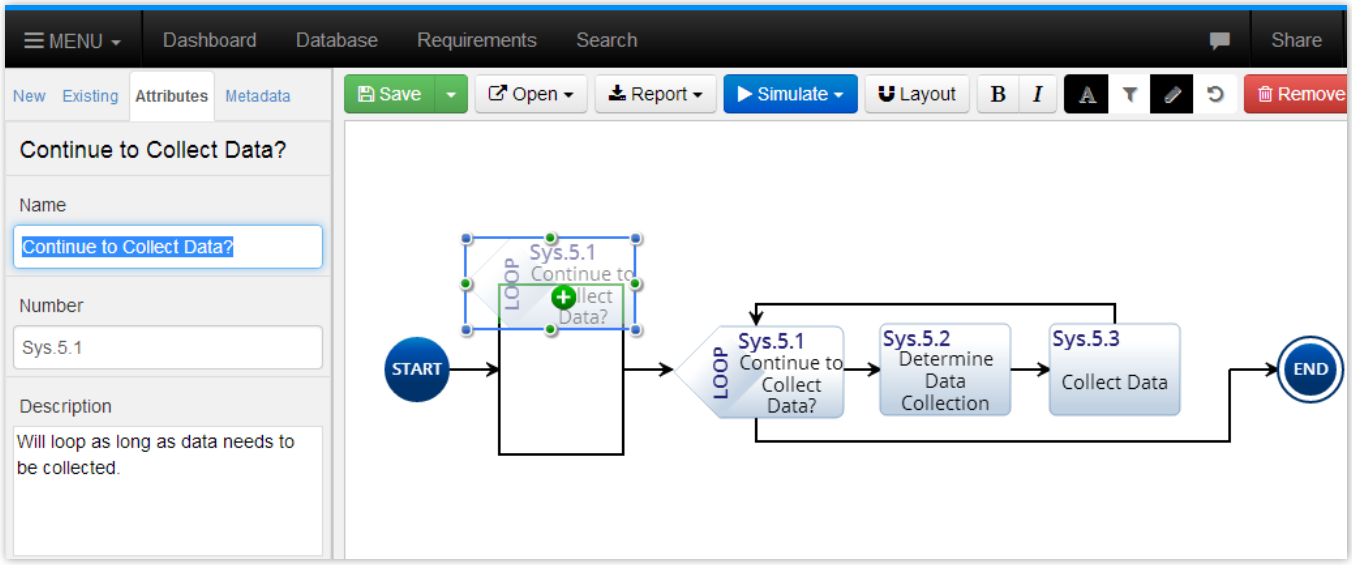
Modifying Model Elements

To modify a model element's attributes including the name, number, and description select the Action, Input/Output, Resource, or Asset then update the information on the side panel.



Moving Diagram Elements

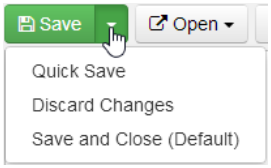
To move a diagram element, first click then hold on that element. Move the element over the desired arrow line segment and release it once that segment turns green.



Note: LOOPs, ORs, and SYNCs will move all diagram elements that are on their internal paths. So to move an OR with Actions on both branches, all that is needed is to move the OR and the Actions on the OR's branches will stay on the branch and move with the OR.

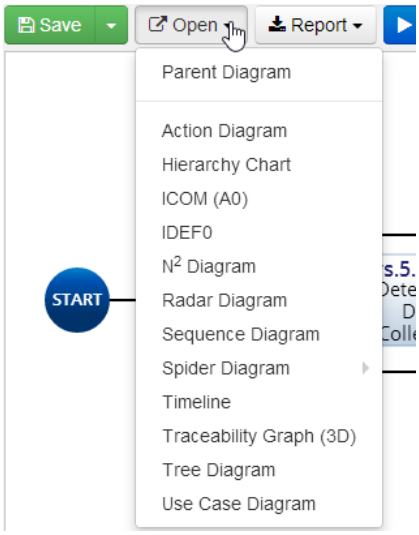
Menu Buttons

Save

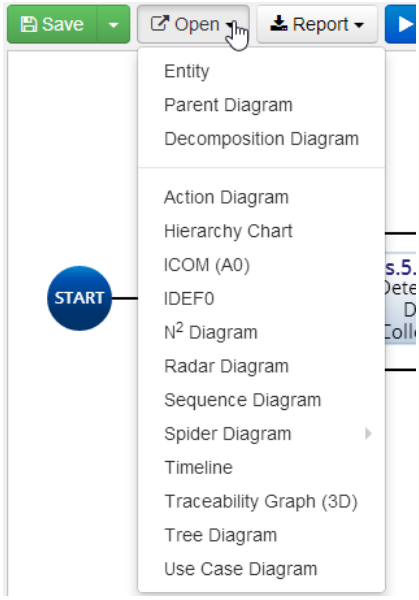


Clicking the save button will Save all changes to the diagram and return to the previous view, this is referred to as "Save and Close". Under the more button attached to the Save are the 3 Save options: "Quick Save", "Discard Changes", and "Save and Close (Default)". "Quick Save" will save the diagram but not navigate you away from your current view. "Discard Changes" will NOT save your changes and navigate you back to your previous view. "Save and Close (Default)" is the same behavior as the main Save button.

Open

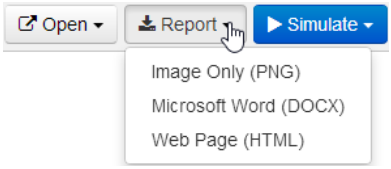


The Open button contains a dropdown of all the available diagrams that can be viewed. Clicking on any of these diagrams will navigate to that diagram. If the diagram entity has a parent (decomposes) then the "Parent Diagram" option will be shown, as above. When an entity is selected on the diagram the Open button will have two additional options, shown below. The first, "Entity" will navigate to the selected entity's Entity View. The second, "Decomposition Diagram" will open the current diagram type for the selected entity.



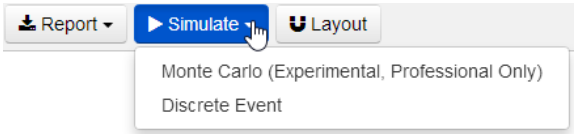
Note: clicking on the Decomposed tag will also open the decomposition diagram.

Reports



Under the Reports button is the options to download the diagram as a transparent picture (Image Only), as a Microsoft Word Report, or as a Webpage.

Simulate

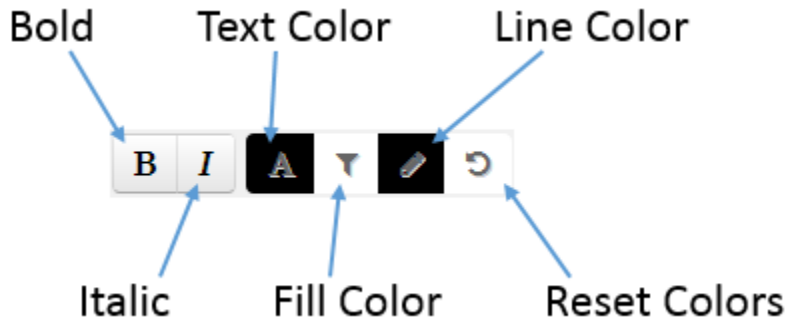


The more button next to the Simulate button contains the option to simulate that diagram in either the Monte Carlo mode or Discrete Event mode. By default clicking on the Simulate button will navigate to the Discrete Event Mode simulator. Only Professional Users will be able to access the Monte Carlo Simulator, all other users will see this option greyed out.

Layout

Clicking the Layout button will reset ALL diagram elements to the layout algorithm's position.

Element Modification



Bold - Bolds/Unbolds the name and number of a diagram element

Italics - Italicies/Unitalicies the name and number of a diagram element

Text Color - Sets the color of the text. Use the right rainbow bar to select the overall color then use the primary box to select the specific hue.

Fill Color - Sets the color of the diagram element. Use the right rainbow bar to select the overall color then use the primary box to select the specific hue.

Line Color - Sets the color of the border line around a diagram element. Use the right rainbow bar to select the overall color then use the primary box to select the specific hue.

Reset Colors - Set the Text Color, Fill Color, and Line Color to the defaults.

Remove

The Remove button will remove the selected model entity from the diagram. This will leave the entity in the Database and can be added back to the diagram via the Existing tab.

Last modified on July 16th 2014.