

SIMULIA Process Composer Integration - Technology preview

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In today's complex product development and manufacturing environment, designers and engineers use various software tools to design and simulate their products. Often, chained simulation process flows are required in which the parameters and results of one system are needed as inputs to another system. The manual process of entering the required data can reduce efficiency, slow product development, and introduce errors in modelling and simulation assumptions. Additionally, the decreasing time-to-market phases and the increasing complexity of advanced systems make it difficult for engineers to properly test the performance of systems, implement changes, and optimize the system architecture.

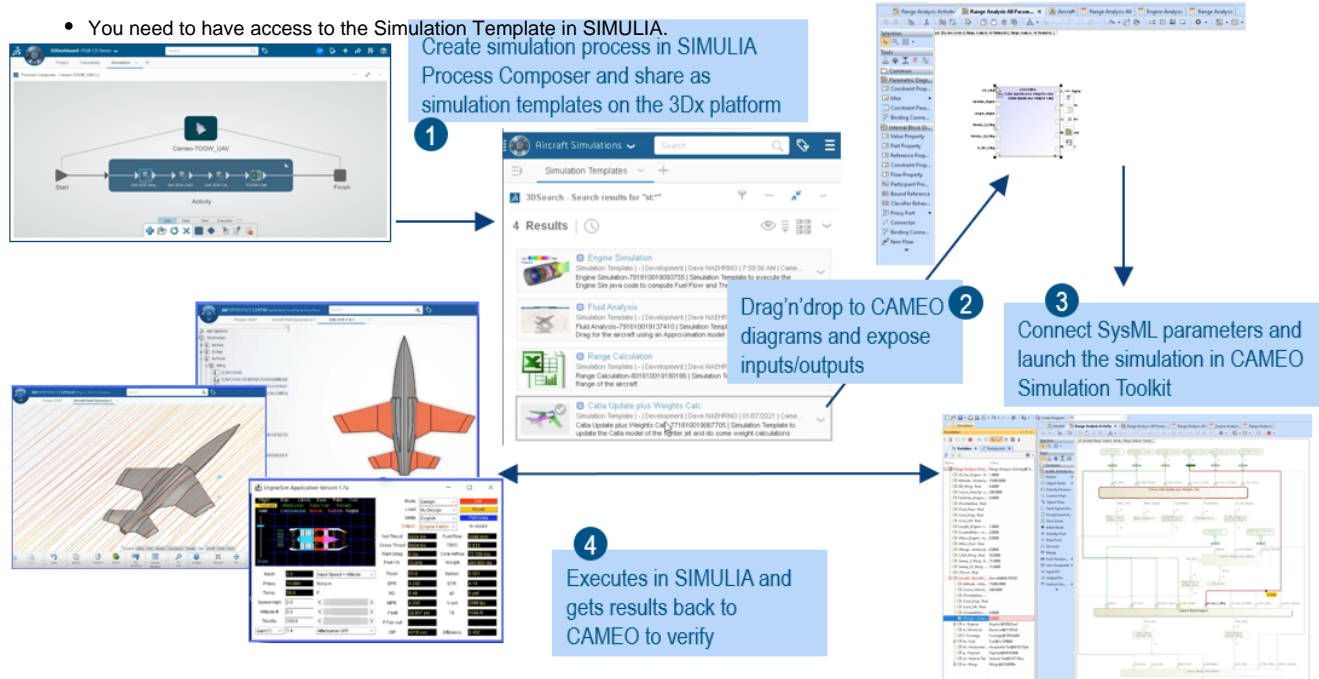
MBSE in SIMULIA and Cameo Simulation Toolkit enables a system model to be simulated and integrated with multidisciplinary engineering tools, providing a high level of fidelity to MBSE/digital engineering.



Prerequisites

To run the simulation with a Simulation Template from SIMULIA, the following conditions must be met:

- The Simulation Template has to be shared on the 3DEXPERIENCE platform On-Premise.
- The Simulation Template type must be One-click.
- You need to have access to the Simulation Template in SIMULIA.



The process of simulation using a Simulation Template from SIMULIA.

To execute a model using a Simulation Template and get the results in a modeling tool follow these steps:

1. Create the Simulation Process in SIMULIA Process Composer and share it as a Simulation Template on the 3DEXPERIENCE platform.
2. Drag the Simulation Template from SIMULIA to the modeling tool and expose its inputs and outputs.
3. Connect a SysML model with SIMULIA Process Composer and launch the simulation in the modeling tool.

Creating and sharing a Simulation Template

When you create the Simulation Process in SIMULIA Process Composer and save it as a template to be used in a modeling tool, make sure that the following criteria are met:

- The simulation Process must expose at least one input and/or output parameter.
- Defined parameters must be scalar: Real, Integer, String, Boolean.
- The Simulation Template type must be One-click.
- The Simulation Template must be shared on the 3DEXPERIENCE platform On-Premise.

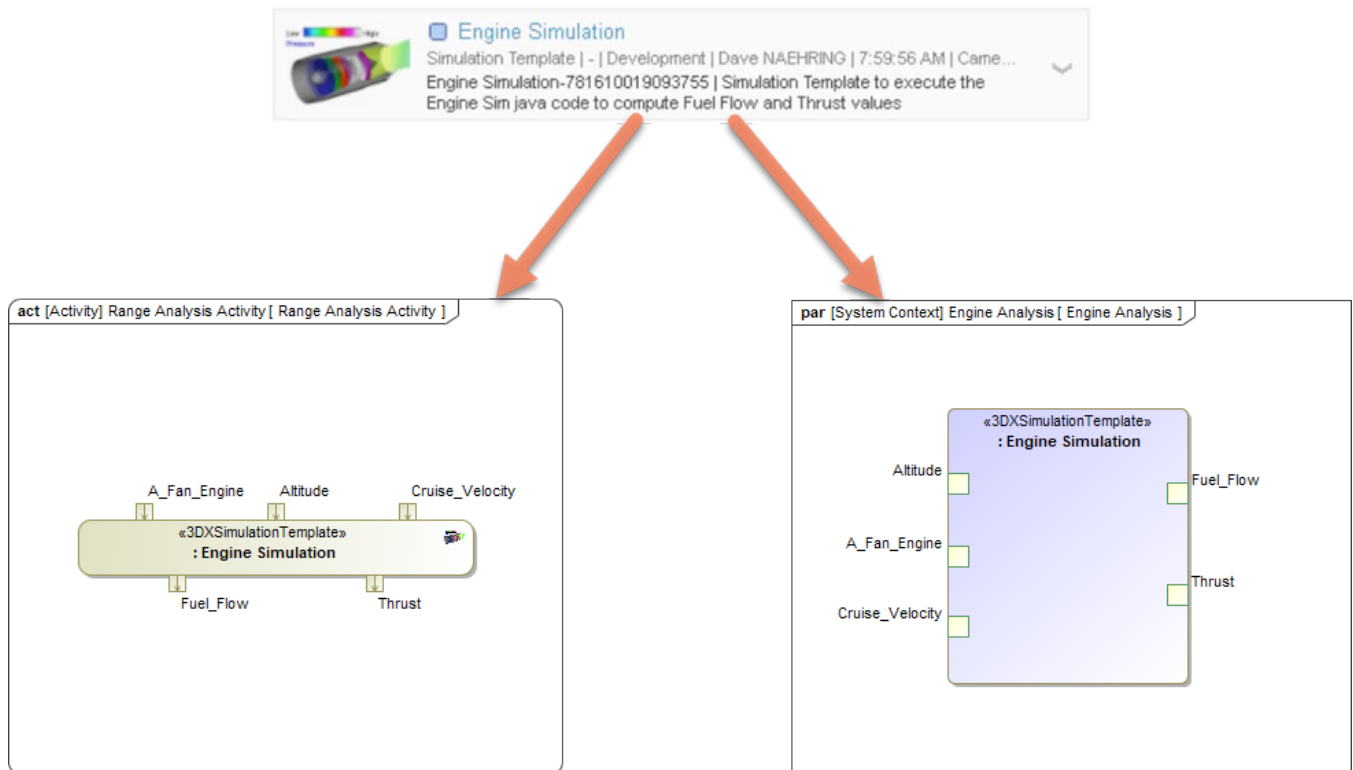
Dragging a Simulation Template to a modeling tool

You can use a Simulation Template in a modeling tool by dragging it to one of the following diagrams:

- An Activity Diagram - in this case, an Activity with a hyperlink to the Simulation Template in SIMULIA is created. In addition, a Call Behavior Action with exposed input and/or output pins is created and displayed in the Activity Diagram.
- A Parametric Diagram - in this case, a Constraint Block with a hyperlink to the Simulation Template in SIMULIA is created. In addition, a Constraint with exposed input and/or output Constraint Parameters is created and displayed in the Parametric Diagram.

To drag a Simulation Template to a diagram in a modeling tool

1. In the main menu of a modeling tool, select **3DEXPERIENCE > Login** and [log into the 3DEXPERIENCE platform](#).
2. Use an internet browser to open the 3DEXPERIENCE platform and find the Simulation Template from SIMULIA that you want to use.
3. Drag the Simulation Template from the 3DEXPERIENCE platform on the web to an Activity or Parametric Diagram in your modeling tool.



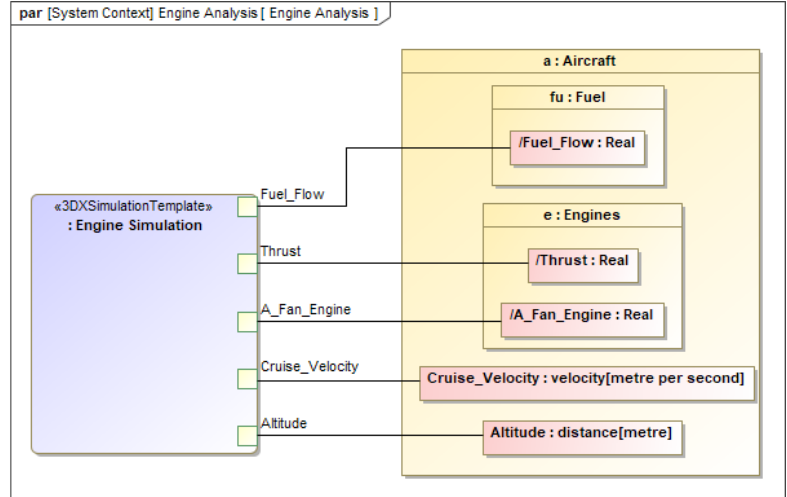
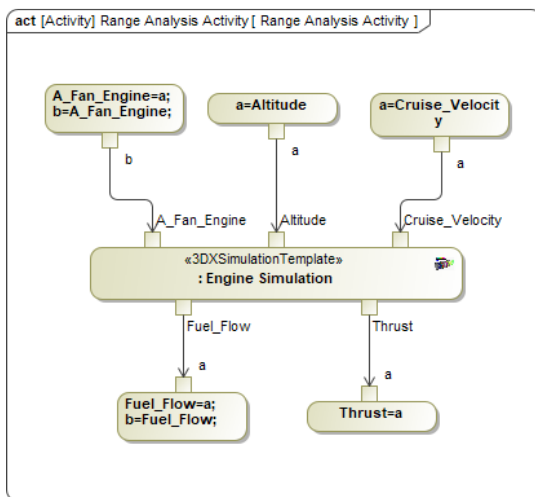
Dragging a Simulation Template from SIMULIA to an Activity or Parametric Diagram.

Connecting a model with SIMULIA Process Composer and launching the simulation

After dragging a Simulation Template to an Activity or Parametric Diagram, connect the SysML model with the SIMULIA Process Composer. This means you need to define what SysML parameters should be provided to the Simulation Template as inputs and what parameters should be retrieved as outputs back to the SysML model. Once you connect the parameters, you can launch the simulation in a modeling tool.

To connect input and output parameters and run the simulation using a Simulation Template

1. Connect the exposed parameters of a Simulation Template:
 - If you work with an Activity Diagram, connect the Pins of the created Call Behavior Action to the required input and/or output parameters.
 - If you work with a Parametric Diagram, connect the Constraint Parameters of the created Constraint with the required input and/or output parameters.
2. Run the simulation using a Simulation Configuration.



The sample diagrams illustrate how to connect the input and output parameters of a Simulation Template.



Storing simulation results

If the **Results Location** property of a Simulation Configuration is specified:

- The simulation results are stored in an Instance Specification.
- A hyperlink to the simulation process stored on the 3DEXPERIENCE platform is added to the Instance Specification with the simulation results.
- If the Instance Specification with the simulation results already has a hyperlink(s), it is removed and a new hyperlink to the simulation process is added and marked as active.
- Hyperlinks to the simulation process are stored on the root Instance Specification with the simulation results.