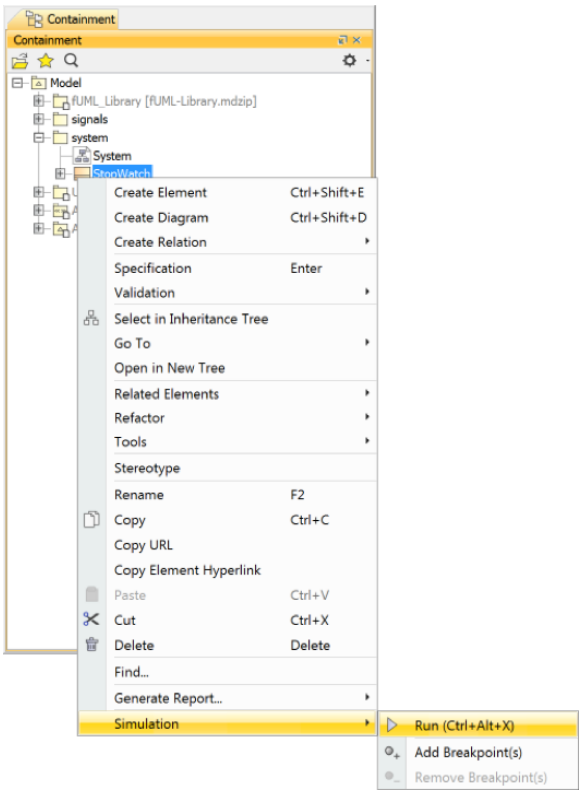
Running the Stopwatch model

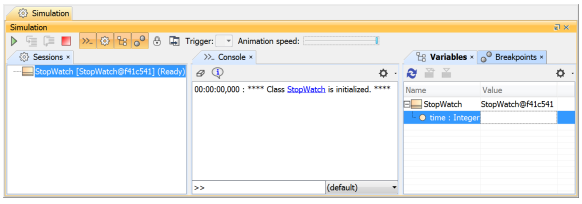
The *StopWatch* class is now ready to be executed. You can execute the *StopWatch* class either from the Model Browser or from the Class diagram.

To run the *StopWatch* Class

1. Right click on the *StopWatch* class in the Model Browser and select **Simulation** > **Run** (see the following figure).



2. The Simulation window will open. It contains four tabs: **Sessions, Console, Variables,** and **Bre akpoints.** At this point, an instance of the StopWatch class is created, which you can see in the **Variables** tab. In addition, a simulation session to execute the *StopWatch* class is created, which you can see tn the **Sessions** tab of the Simulation window. (See the following figure.)



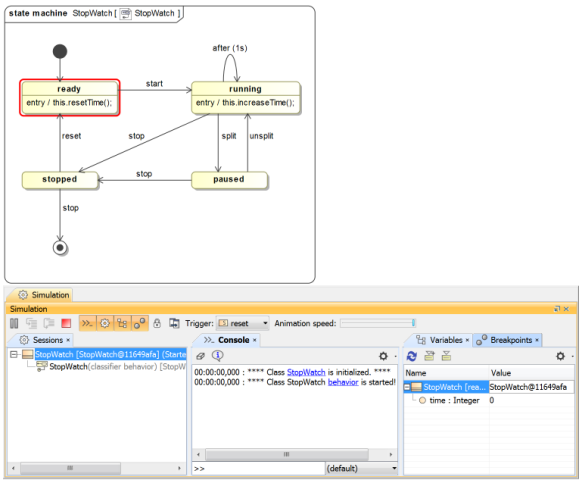
3. Click the **Start** button on the Simulation window toolbar.

Once you have clicked the **Start** button, the classifier behavior of the *StopWatch* Class, which is the *Stop Watch* State Machine, starts executing. A new session to execute the *StopWatch* state machine is created under the simulation session of the *StopWatch* class, and the *StopWatch* state machine diagram will be open and ready for the simulation.

The *StopWatch* State Machine execution will start from the initial Pseudostate and automatically move to the *ready* state because the Transition that connects the initial Pseudostate to the *ready* State does not have a defined trigger. When the *ready* State is entered, its entry Behavior is executed, which calls the *re setTime* operation. After this, the *StopWatch* State Machine is in the *ready* State, and the *time* attribute is set to 0 (see the following figure).

Related pages

- Magic Alf Analyst
  - Running a model with Alf
- Magic Model Analyst
  - Executing the stopwatch model
  - Creating User Interface mockups for the stopwatch model



Now we want to trigger the *StopWatch* object to move from the *ready* State to the *running* State. To do this, we need to send a *start* signal to the *StopWatch* object.

To send a *start* Signal to the *StopWatch* object

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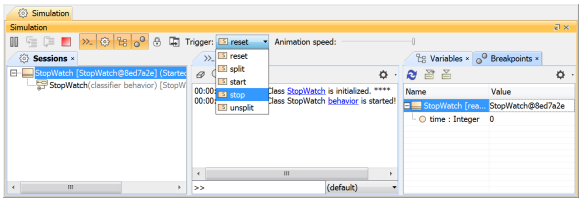
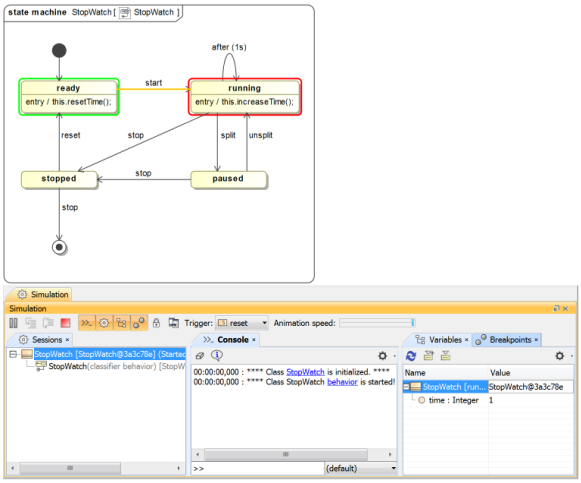
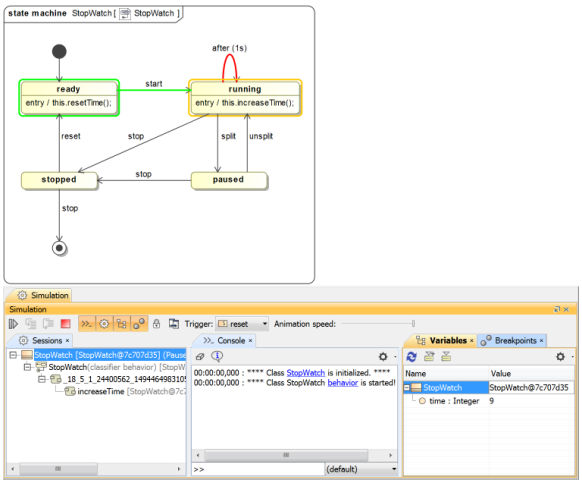
1. Select the *StopWatch* node in the **Variables** tab. The signals that can be sent to the *StopWatch* will be listed in the **Trigger** drop-down menu.
2. Select the **start** signal from the **Trigger** drop-down menu (see the following figure).



Once the *start* Signal has been sent, the *StopWatch* enters the *running* State. On entry to the *running* state, its entry Behavior is executed, which calls the *increaseTime* operation, incrementing the *time* attribute by 1 (as shown in the **Variables** tab in the figure below).



The *StopWatch* object stays in the *running* State, and the Time Event is triggered in this State every second. Therefore, a new simulation session will be created to call the *increaseTime* operation every second, and the *time* value will increment by one every time the operation is executed (see the following figure).



While the *StopWatch* object is in the *running* state, we can send a *split* signal to trigger a transition to the *paused* state or send a *stop* signal to trigger a transition to the *stopped* state.

To send a *split* Signal to the *StopWatch* object

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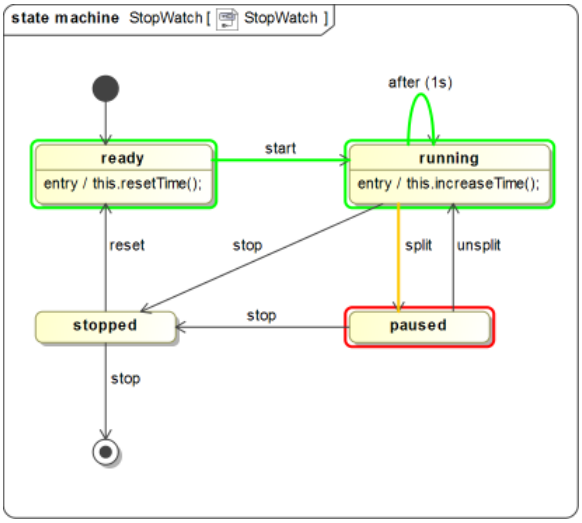
1. Select the *StopWatch* object in the **Variables** tab.
2. Select the **split** Signal from the **Trigger** drop-down menu on the Simulation window toolbar. (You may have to temporarily reduce the animation speed in order to be able to select a trigger before the Time Event fires.) The state of the *StopWatch* object will be changed to the *paused* state (see the following figure).



You can transition the paused *StopWatch* object to the *running* state by sending an *unsplit* Signal to the object.

To send an *unsplit* Signal to the *StopWatch* object

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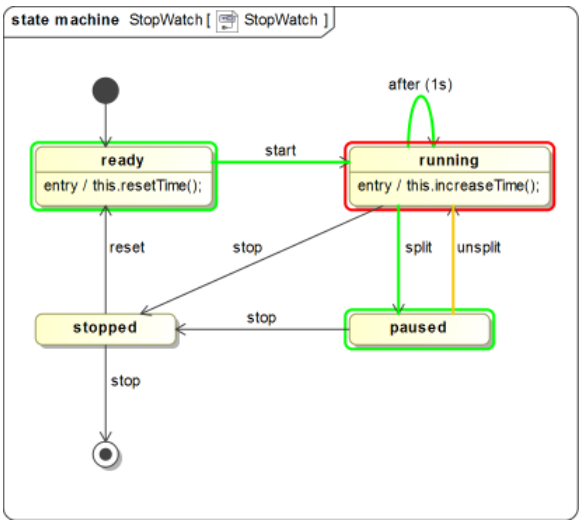
1. Select the *StopWatch* object in the **Variables** tab.
2. Select the **unsplit** Signal from the **Trigger** drop-down menu on the Simulation window toolbar. The state of the *StopWatch* object will be changed to the *running* state (see the following figure),

and the *time* value will start to continuously increase again.



To send a *stop* Signal to the *StopWatch* object

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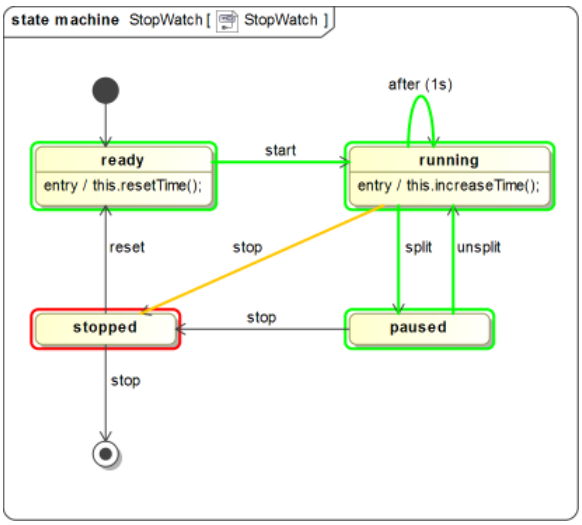
1. Select the *StopWatch* object in the **Variables** tab.
2. Select the **stop** Signal from the **Trigger** drop-down menu on the Simulation window toolbar. (You may have to temporarily reduce the animation speed in order to be able to select a trigger before the Time Event fires.) The state of the *StopWatch* object will be changed to the *stopped* state (see the following figure).



In the *stopped* state, if the *reset* Signal is sent to the *StopWatch* object, the object will go to the ***ready*** Sta te, and the *time* value will be reset to zero by calling the *resetTime* operation. If, instead, the *stop* Signal is sent to the object again, the object will go to the Final State, the simulation will stop, and all of the simulation sessions will be closed.

From this point, you can also explore additional features of Magic Model Analyst for executing the *StopWatch* model, as described in the MSI Tutorial:

- Executing the StopWatch instance specification
- Executing the StopWatch using Simulation Configuration
- Creating User Interface mockups for the stopwatch model