Phase 3. Placing agents in GIS space

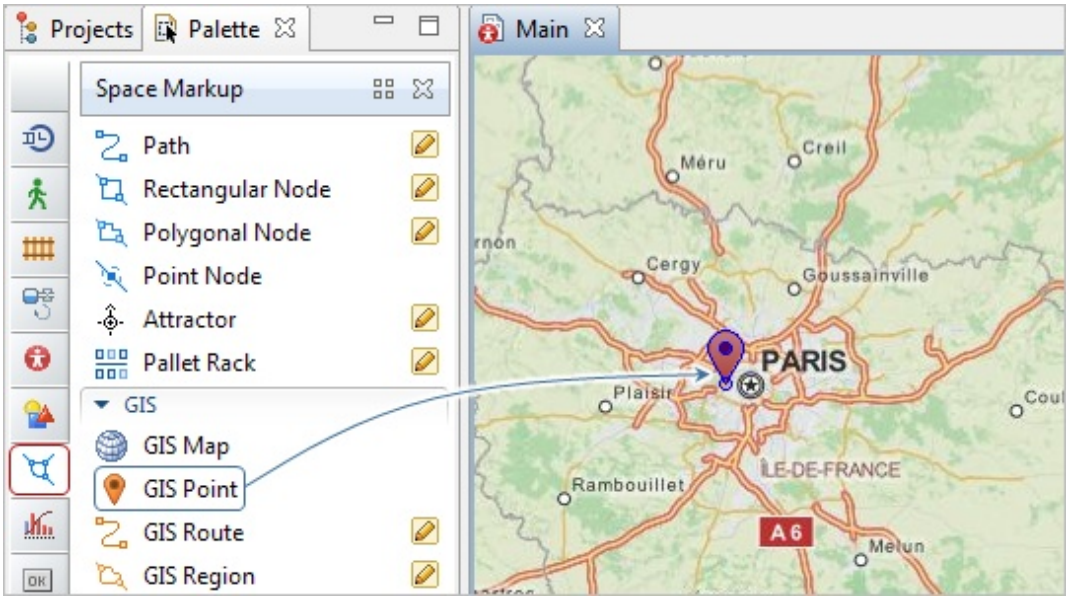
There are several different methods you can use to define an agent's position on the map, starting with specifying the geographic coordinates of some point on the map and ending with calling GIS specific methods.

We will use GIS space markup objects and the GIS search results menu. These techniques allow you to define positions on the map in a couple of mouse clicks, and do not require writing any Java code.

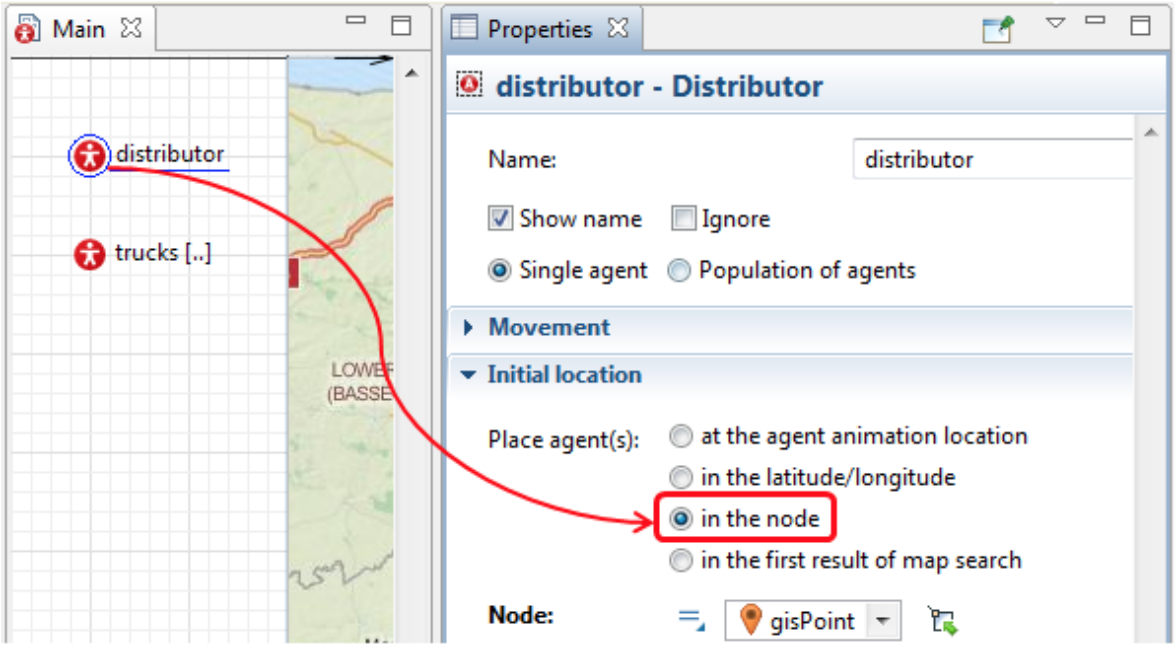
Since we have one distribution center, it makes sense to place it in some point on the map.

To place an agent in the GIS point

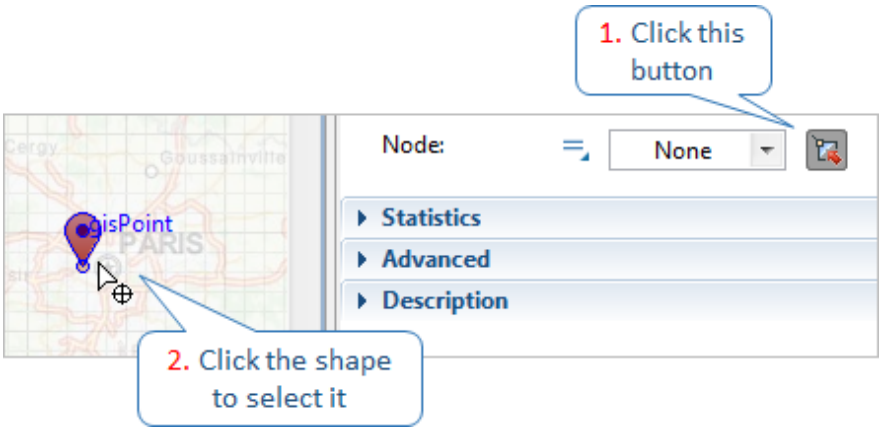
1. Choose a location on the map where you would like to place the distribution center. You can zoom the map to a smaller scale where you can even pick a certain address in some city. We chose a location somewhere near Paris.
2. Open the **Space Markup** palette and drop the **GIS Point** on the chosen location on the map.



3. Select the `distributor` agent on the `Main` and go to its **Properties** view.
4. In the **Initial location** section, select to **Place agent(s)**: *in the node*. Then we need to specify the node.



5. You can select the GIS point that you have created earlier from the drop-down list next to the parameter, or you can select it on the map after clicking the selection button.

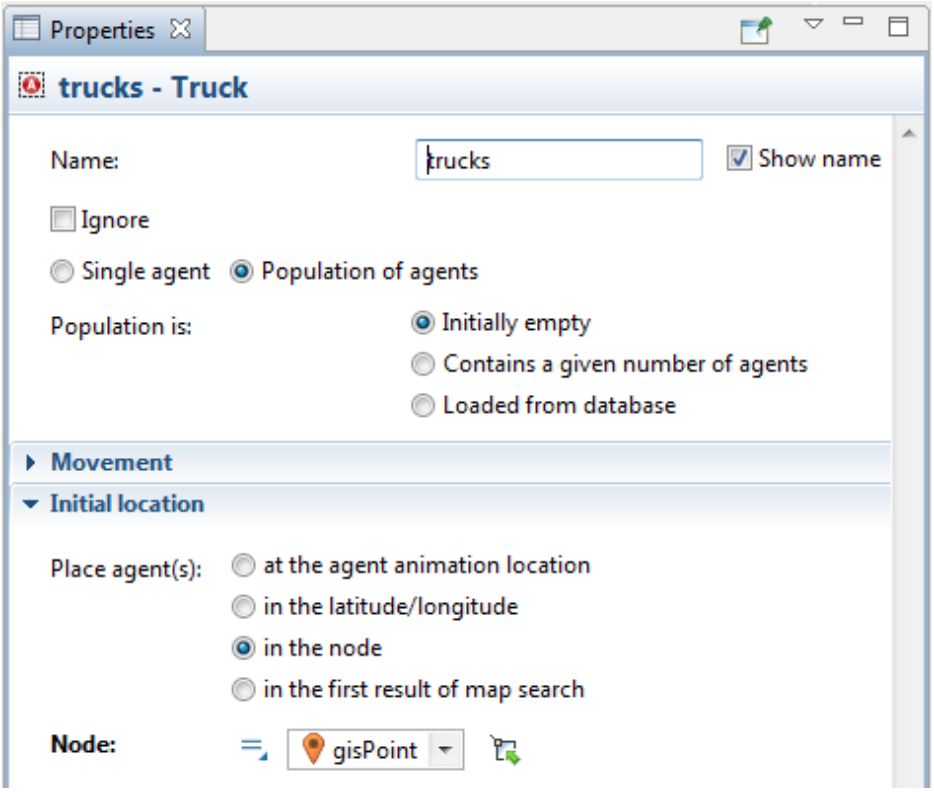


6. You can run the model now and check right away the location of the distribution center animation.

To place the fleet at the center

In our model, a truck delivers the product after a retailer orders it which means it makes sense to keep the fleet at the distribution center to be able to send a loaded truck anytime in different directions.

1. Select the `trucks[..]` population and choose the same node as for the `distributor` as the trucks' initial location.

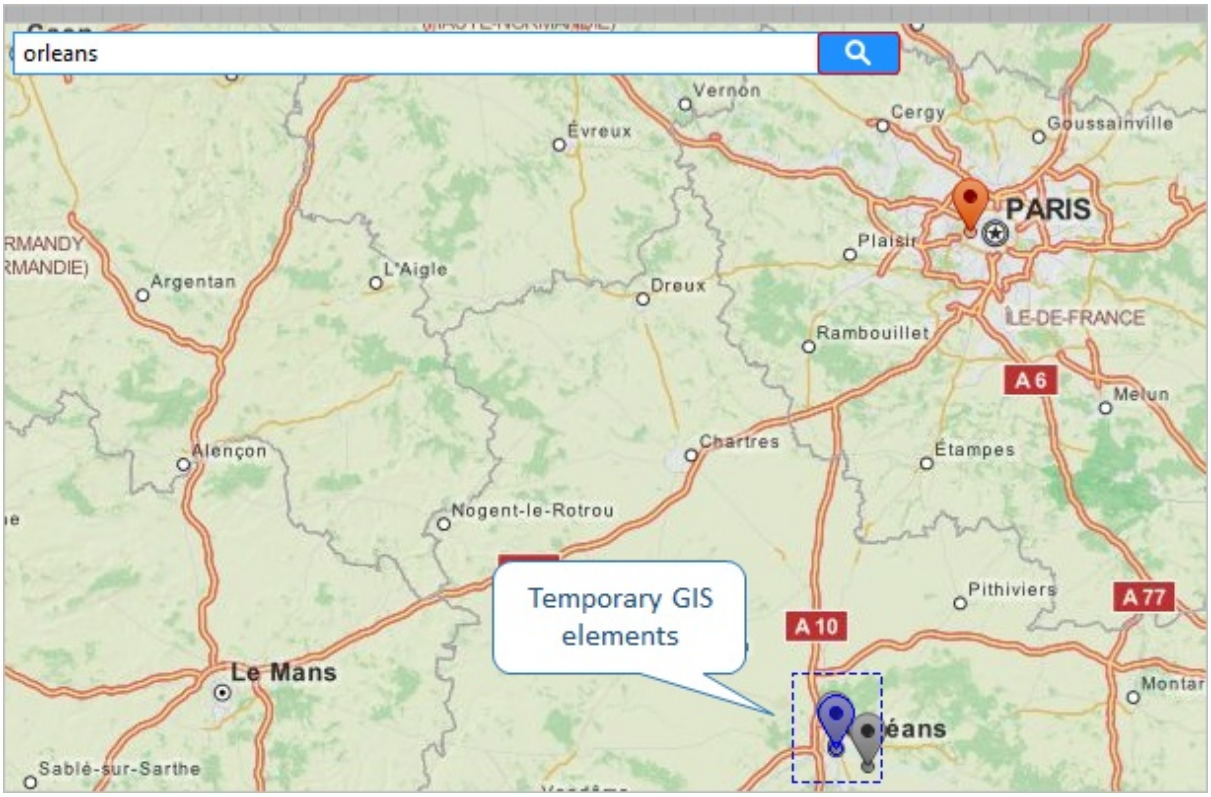


Now we will place retailers on the map while, at the same time, creating each of them as a single agent.

To place an agent using search

1. Double-click the map to enter the edit mode. The search edit box will appear. We will use it to find locations on the map and place agents there.
2. If needed, first pan and zoom the map to display several cities around your distribution center location (its GIS point on the map).
3. Type the name of the city where you want to place a retailer in the search field. Click the button  or press Enter on the keyboard to start searching for the location.

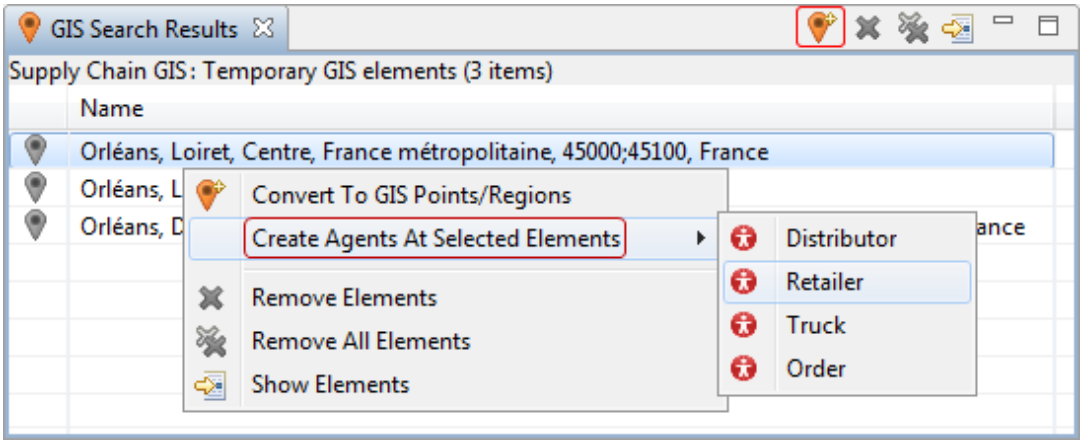
   The GIS search engine first checks the visible area of the world map, then, in case nothing is found, it starts searching world-wide.



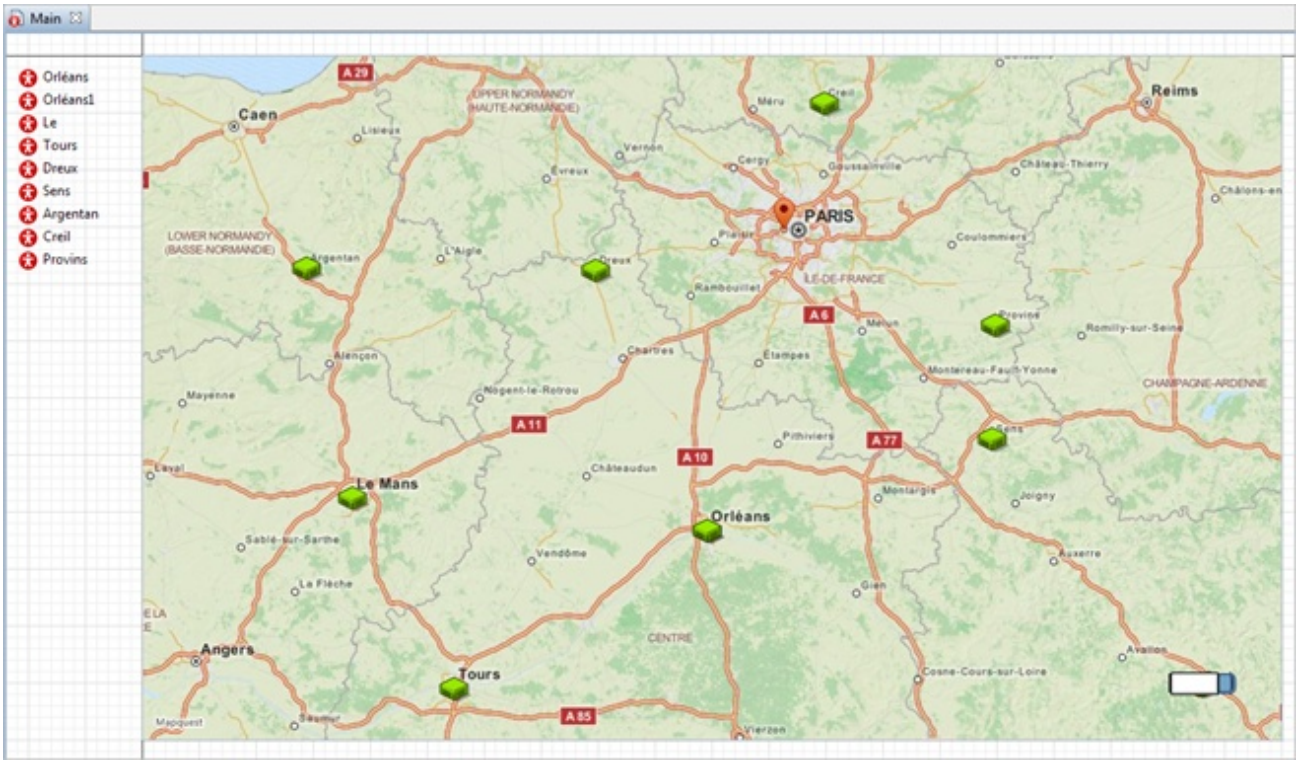
4. AnyLogic will display the list of search results in the **GIS Search Results** view that opens automatically. Select one of the results as the location for a retailer. Usually, it is the first search result that you were looking for, but if you need to double-check the actual search result location, double-click it in the list, AnyLogic will highlight it on the map.

   And vice versa, when you select a temporary element on the map, the search result is highlighted in the **GIS Search Results** view.

5. Right-click the search result in the view and select the option **Create agents at selected elements** > **Retailer** from the context menu, or highlight an element and click the button on the toolbar of the view.



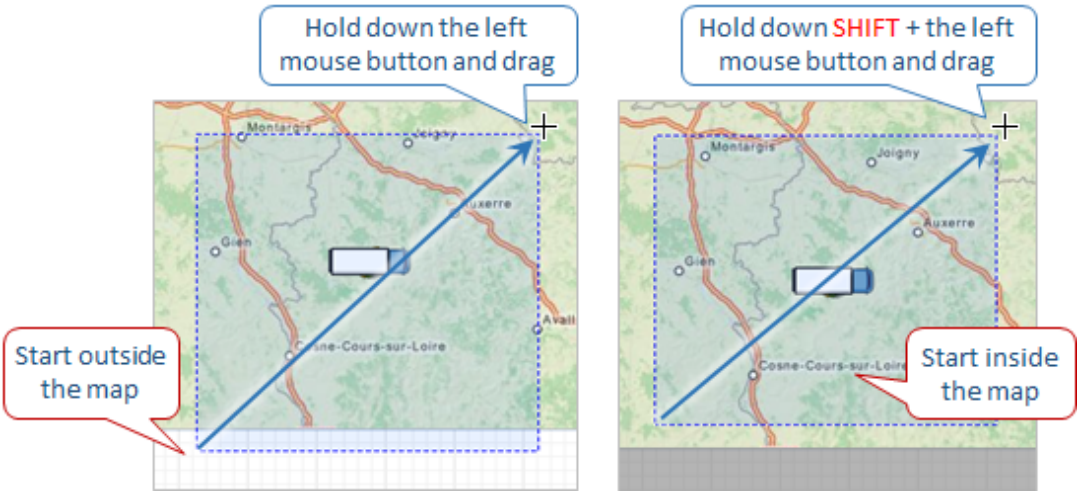
6. The agent of this type will appear on the `Main` diagram, and its animation will be placed on the map in the specified location.
7. Repeat these steps to create several retailers on the map in the geographic locations you prefer: several single agents of the type `Retailer`.



8. Click the toolbar button  of the **GIS Search Results** view to clear the view and the map, then close the view.

As you see, we use different methods of creating and placing agents in space, or on the GIS map. Each of the retailers is created as a single agent with the help of the GIS search, and their position in space is defined with the position of the animation figure, while the distribution center and trucks are placed in the GIS point (the center was created in the wizard as a single agent, the trucks are still to be created). It does not matter for them where their animation is positioned at the model design-time. That is why you can see in the figure above that we have moved them to the lower right corner. The actual position of those agents is displayed at the model runtime.

The animation figures are usually placed in one point (the center of the map). If you want to work with a multiple selection of the objects on the map (either animation, or markup objects), you can select them in two different ways:



When the agent's position and its animation are defined by the properties and not their actual position on the map, you can place the animation even outside the visible area that you are working with in this model, as you clearly do not need to work with those figures at the design-time.

But if you need then to make changes in the **Properties** of an animation figure, go to this agent on `Main`, right-click it and choose **Select animation** from the context menu. If the animation figure is out of the visible area, you will see a warning.

Let us run the model: we have marked the main points of our supply chain on the GIS map.

Next, we will define the `Retailer` behaviour: a retailer should generate a demand for the product to be delivered. This is where the process starts.

Reference model: Supply Chain GIS - Phase 3

Phase 2. Creating agents

Phase 4. Sending orders from the retailer