Smac Tool

User guide

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Download Eclipse IDE

The fastest and most recommended way to use the SmaC tool is to use the INNoVaSerV IDE which already incorporates the SmaC plugins to implement smart contracts in Solidity. You just need to download the tool, unzip the file and click on the executable. The tool already incorporates 3 contracts obtained from the official Solidity documentation

Download INNoVaServ: download INNoVaServ

If you want a more recent version of the eclipse IDE, you can download this version of Obeo Designer with the plugins already installed and with smart contracts built into it.

Download ObeoDesigner: download ObeoDesigner

Create New Project

Once the plugins are installed, a new project must be created to host the Smart contract model to be defined. To do this, you must click on the "*New*" tab and select the "*Project*" option:

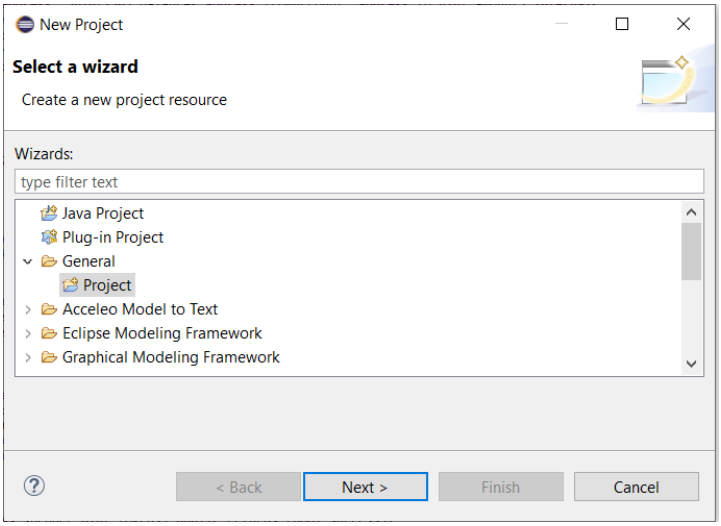

Image 1: You can choose a General Project or Xtext Project

Next, it will be necessary to name the Project:

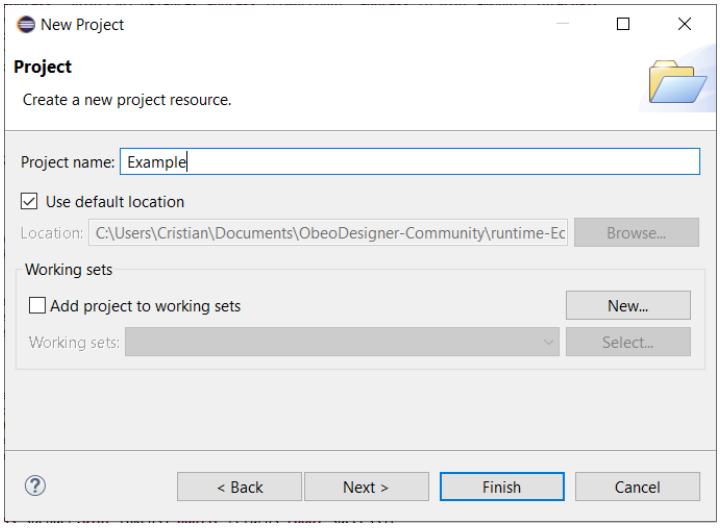

Image 2: Choose a name for your project.

Once entered, click on the "*Finish*" button for the IDE to create a project with the chosen name.

Create Smac Model

On the previously created project, you must right click on it and select the "New"> "Other" option to display the Eclipse IDE wizard in order to select the SmaC model to be able to define a smart contract

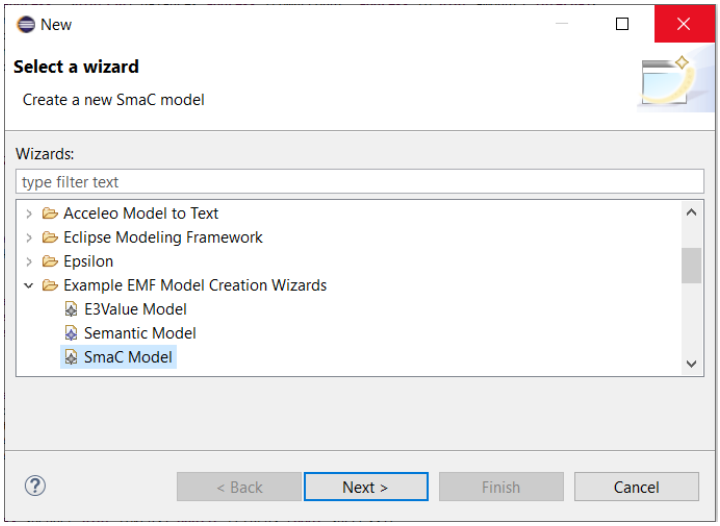

Image 3: Click over SmaC Model

Once selected, you must click on the "Next" button and proceed to give a name to the smart contract model. It is important not to change the extension, which should be ".sce".

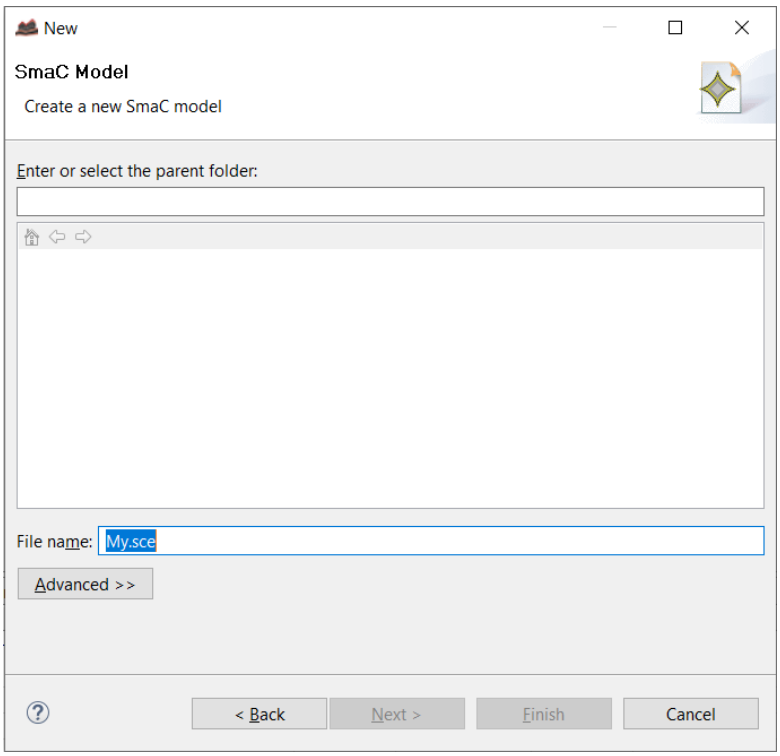

Image 4: Choose a name for your SmaC Model

Finally, you must indicate the root of the model to be represented. In this case, the File option must be selected.

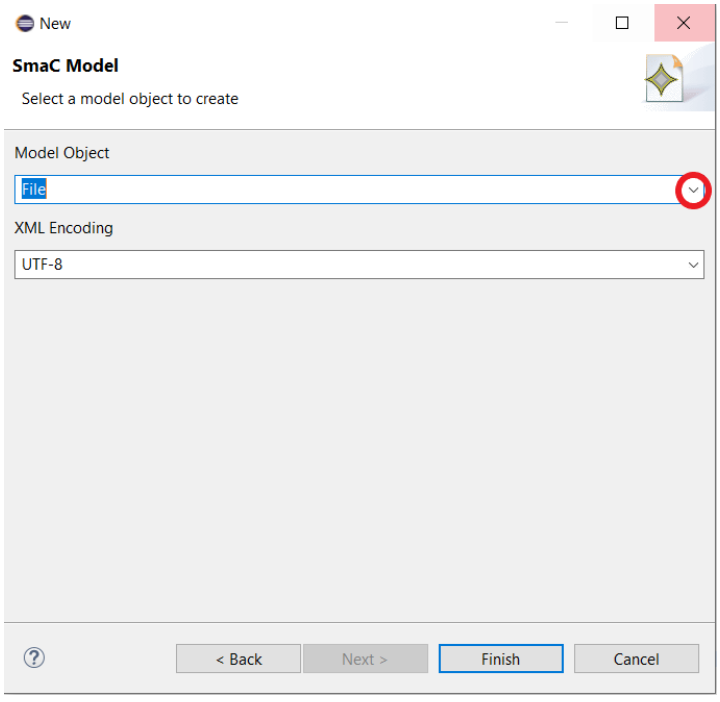

Image 5: Select "File" as the root of the Smac Model that you are going to define

If a general project was selected in step 1, the following message is likely to appear:

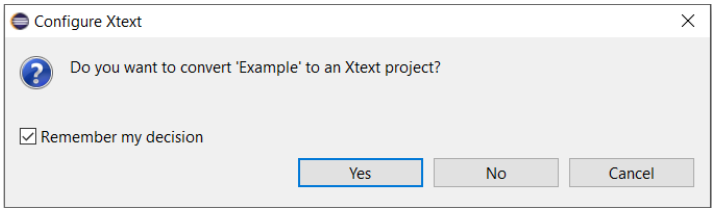

Image 6: Convert the Project to Xtext Project

Skip it by clicking on “Yes”.

It is necessary to open the file using the SmaC Editor developed to enjoy the functionality (Highlighting syntax, autocomplete code, quickfixes ...) as follows:

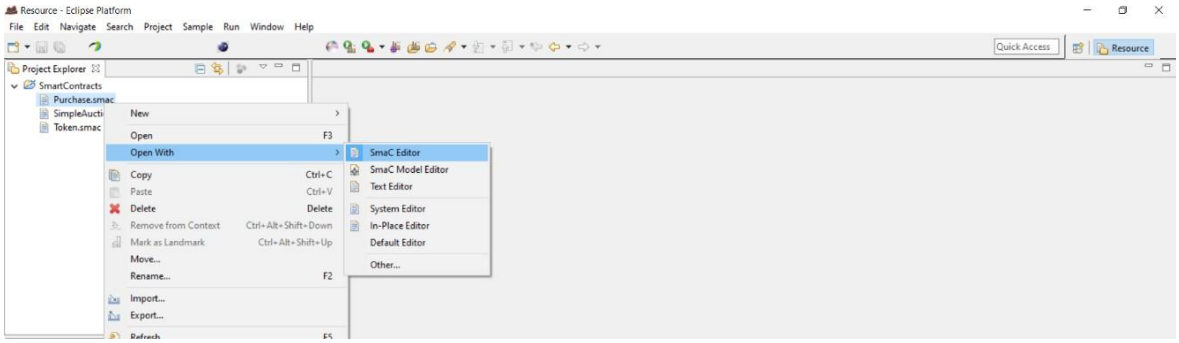

Image 7: Open file .sce with SmaC Editor

You can download a video tutorial in this link: http://www.kybele.es/innovaserv/downloads/VideoSmartContract.mp4

Tips to create Smac Models

Language Patterns:

1. Define compiler's version **(Obligatory).**
2. Define libraries.
3. Define import(s).
4. Define interface(s).
5. Define global variable(s).
6. Define contracts **(At least 1).**
7. Define local variable(s).
8. Define contract's constructor(s).
9. Define contract's modifier(s).
10. Define contract's event(s).
11. Define contract's function(s).

When defining a contract using the tool, it proposes code autocomplete suggestions using the CTRL + SPACE key combination

Language demands a gas restriction within the loops.

Generate EMF Models from Smac models

Next, we will proceed to explain the procedure to generate emf models from the specifications of smart contracts developed from the SmaC DSL. First, the "clean" option must be selected in the Eclipse Project tab:

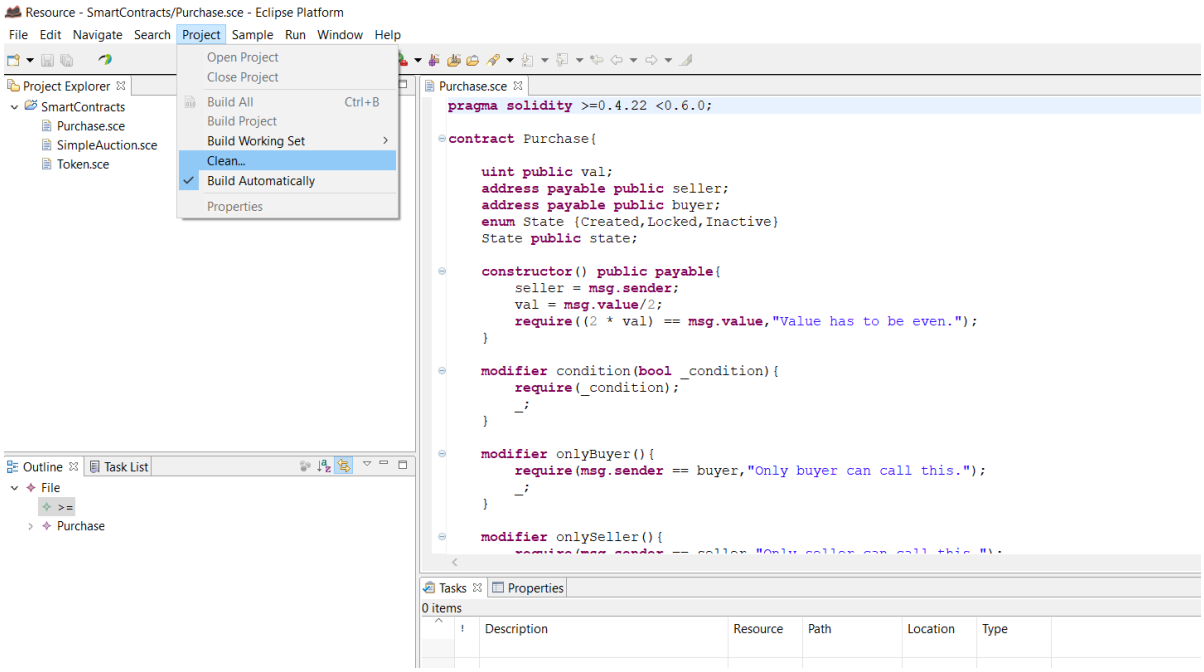

Image 8: Select option "Clean"

Now we must proceed the project where our models with extension ".sce" are located:

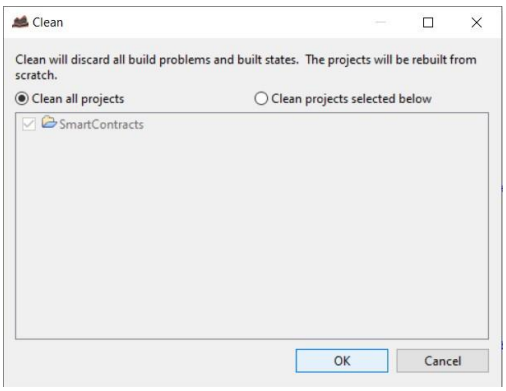

Image 9: Select Project

Once the ok button is pressed, the IDE will generate the EMF models corresponding to the smac models as can be seen in the following image:

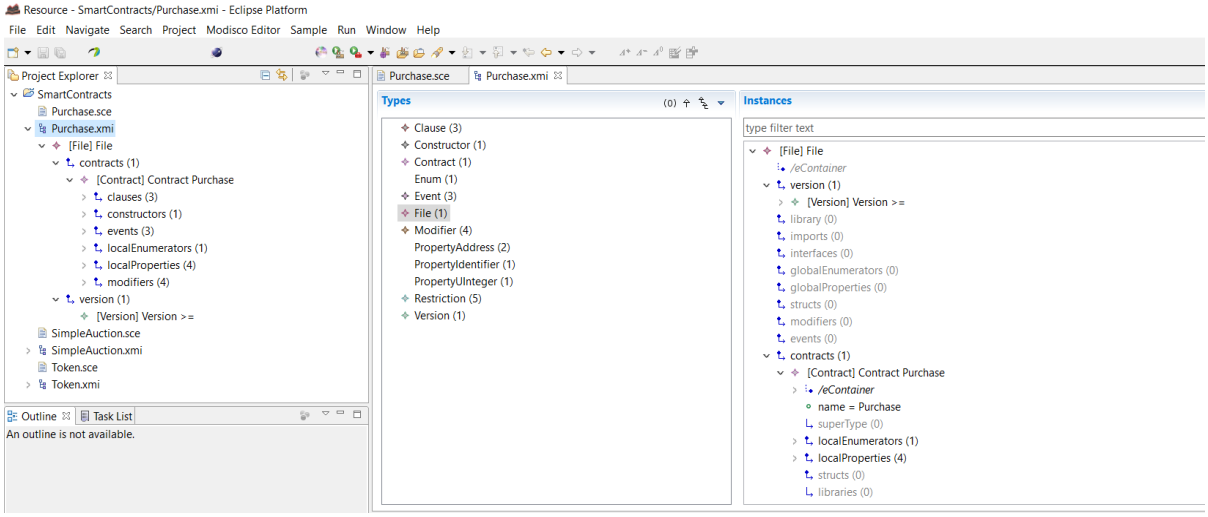

Image 10: Generate EMF Models from Smac Models

You can download a video tutorial to generate EMF Models in SmaC Tool if you click in this link: https://github.com/KybeleGroup/SmaC/blob/master/GenerateEMFModels.mp4