

# **Modif Documentation**

-

## **Refactoring User Guide**

*This document explains the steps for using ModifRoundtrip for a Metamodel Refactoring*

June, 2015

by Paola Vallejo, Jean Philippe Babau

## Table of contents

<b>1. Create project, folders and ecore metamodel.....</b>	<b>3</b>
1.1. Create a project.....	3
1.2. Add Xtext nature.....	3
1.3. Add Folders.....	3
1.4. Create metamodel.....	3
<b>2. Execute Ecore Modif.....</b>	<b>5</b>
1. Refactoring.....	5
Specify Domain Metamodel and Generate Modif model.....	6
Edit Modif Model.....	7
Refactor.....	8
<b>3. Contact.....</b>	<b>10</b>

# 1. Create project, folders and ecore metamodel

## 1.1. Create a project

Create a new Empty EMF project and, for example name it *Test\_Vehicle*

File New Other... Eclipse Modeling Framework/Empty EMF Project Next Specify the project name [Test\_Vehicle] Finish

## 1.2. Add Xtext nature

Add the Xtext Nature to the Test project

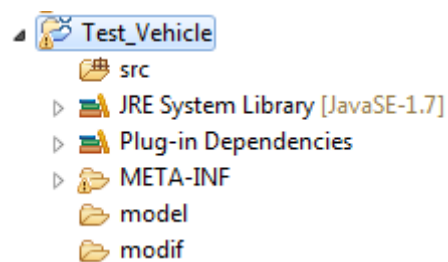
Right click Test\_Vehicle project Configure Add Xpand/Xtext Nature

## 1.3. Add Folders

Keep the **model** folder and add two additional folders:

Right click ModifTest New Folder [Specify the folder\_name] Finish

1. metamodel
2. modif

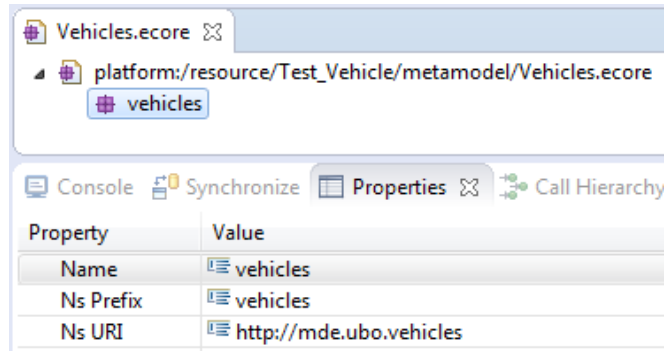


## 1.4. Create metamodel

In the **metamodel** folder, create a new ecore model. And for the example, name it *Vehicles.ecore*

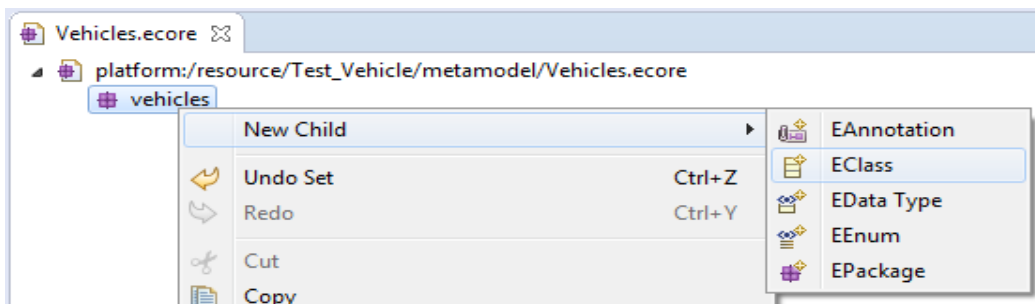
Right click on Test\_Vehicle/metamodel New Other... Eclipse Modeling Framework / Ecore Model Next [give a name for your ecore] Finish

Then set the.ecore model properties as follows:



Add the EClasses to the metamodel.

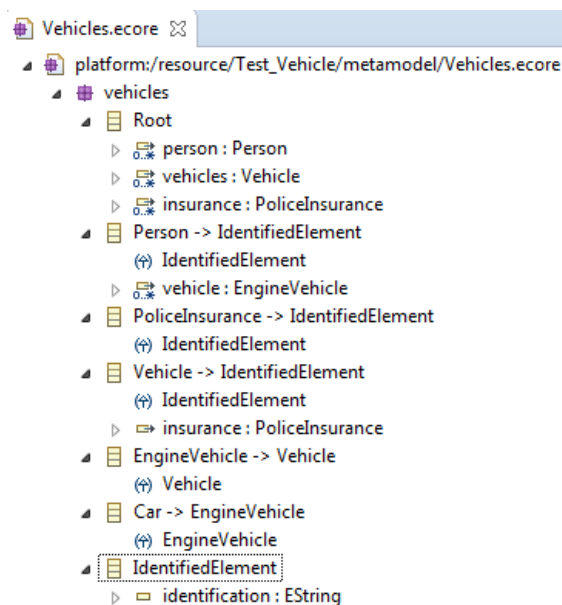
Right click on *vehicles* package    New Child    EClass



Add the EReferences and EAttributes to the metamodel.

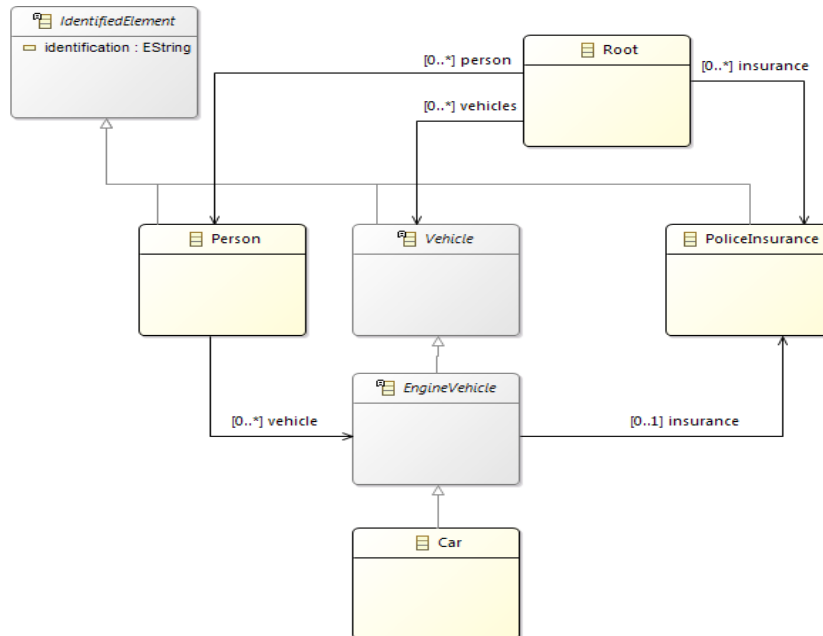
Right click on EClass    New Child    [Select EReference or EAttribute]

It must look as follows:



In this metamodel there is a **Root** EClass composed of **Persons** (*person* EReference), **Vehicles** (*vehicles* EReference) and **PoliceInsurances** (*insurance* EReference). Person, Vehicle and PoliceInsurance have an identification (*identification* EAttribute). A Person can have some Vehicles. Each Vehicle has an associated PoliceInsurance.

Graphically, it looks as follows:

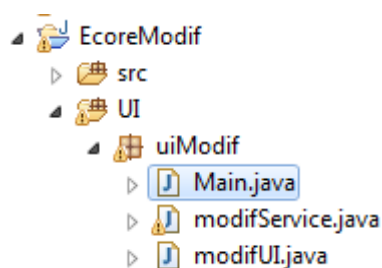


**Please note:** as usual with Ecore, an *EClass* plays a root role in the graph of *EClasses*; the name *Root* is not mandatory but, what is important is that, this *EClass* contains directly or indirectly all the other concrete *EClasses*

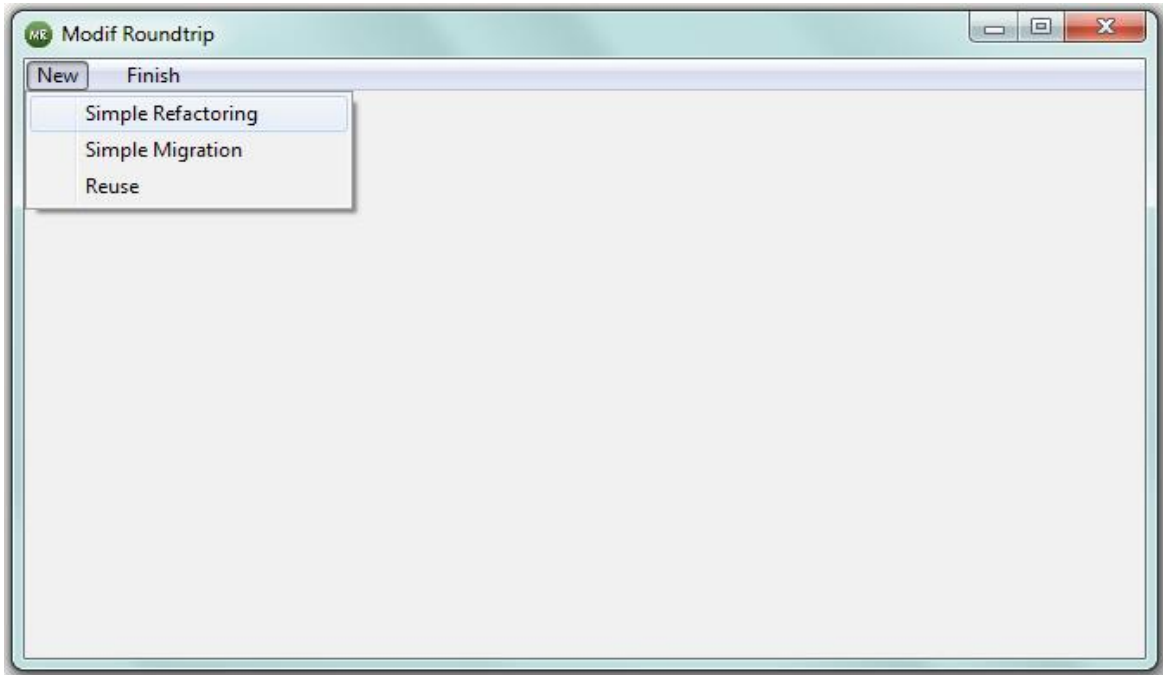
## 2. Execute Ecore Modif

### 1. Refactoring

Open the EcoreModif project, navigate to *UI/uiModif* and execute *Main.java*



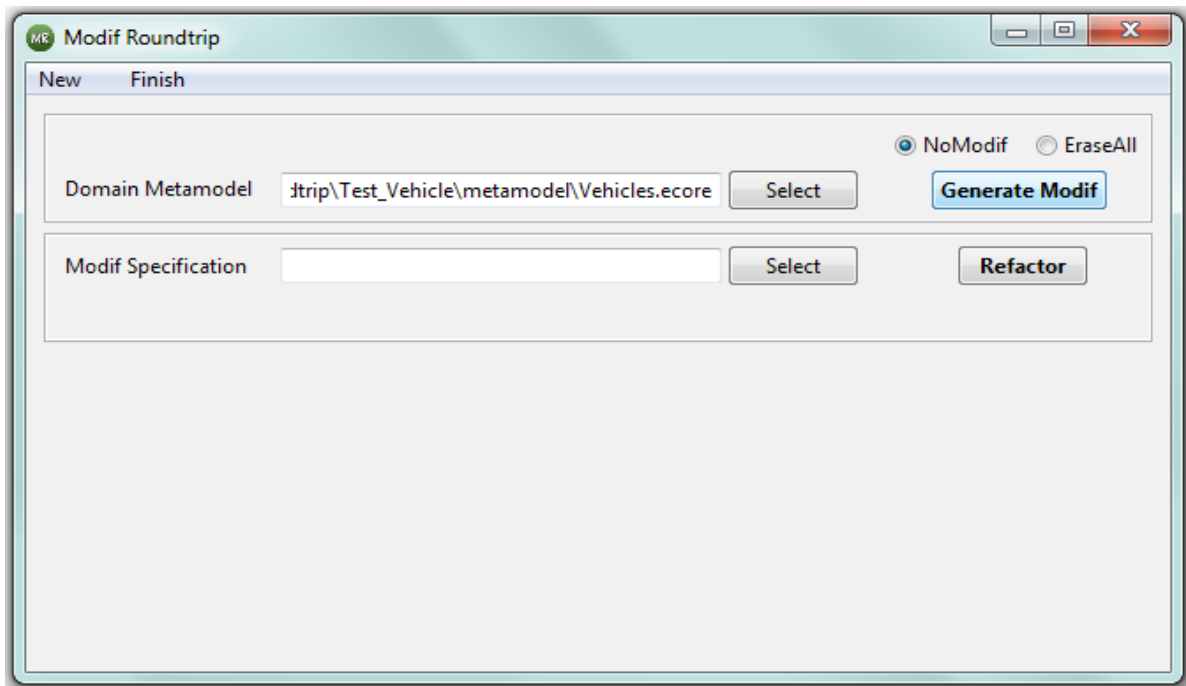
In the oped ModifRoundtrip form, click on *New* and then click on *Simple Refactoring*.



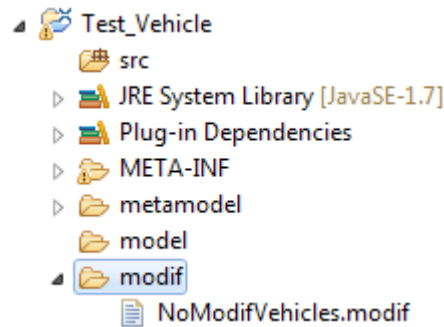
Now perform the following steps in order:

### Specify Domain Metamodel and Generate Modif model

- Click on *Select* for Domain Metamodel and specify the path to the ecore file *Vehicles.ecore* (Test\_Vehicle/metamodel folder)
- Select *NoModif* (or *EraseAll*) and then click on the **Generate Modif** button. If the Domain Metamodel path is not correct,an error message appears when executing the modif model generation.



- Refresh the modif folder, the modif model appears.



## Edit Modif Model

Make a copy of the NoModifVehicles.modif (or EraseAllVehicles.modif) file, paste it in the **modif** folder and name it %vehicles-to-Vehicles2.modif+. Then, open the Vehicles-to-Vehicles2.modif using the text editor or the xText editor as shown below:

```

Main.java  NoModifVehicles.modif  Vehicles-to-Vehicles2.modif
- root vehicles to vehicles2
  Prefix vehicles to vehicles2
  URI "http://mde.ubo.vehicles" to "http://mde.ubo.vehicles"

  class {
    Root to Root {
      ref person to person bounds (0,-1) to (0,-1)
      ref vehicles to vehicles bounds (0,-1) to (0,-1)
      ref insurance to insurance bounds (0,-1) to (0,-1)
    };
    Person to Person {
      ref vehicle to vehicle bounds (0,-1) to (0,-1)
    };
    PoliceInsurance to PoliceInsurance ;
    Vehicle to Vehicle ;
    EngineVehicle to EngineVehicle {
      ref insurance to insurance bounds (0,1) to (0,1)
    };
    Car to Car ;
    IdentifiedElement to IdentifiedElement {
      att identification to identification bounds (0,1) to (0,1)
    }
  }
  }

```

Edit the modif file in this way:

- For **URI**, rename it to %http://mde.ubo.vehicles2+
- For class **Root**
  - For **person** reference, rename it **to** people
  - For **insurance** reference, rename it **to** insurances
- For class **EngineVehicle**, put the key words **hide** and **flatten**
- For class **IdentifiedElement**, put the key words **hide** and **flatten**

Finally, save the model, it will look as shown below

```

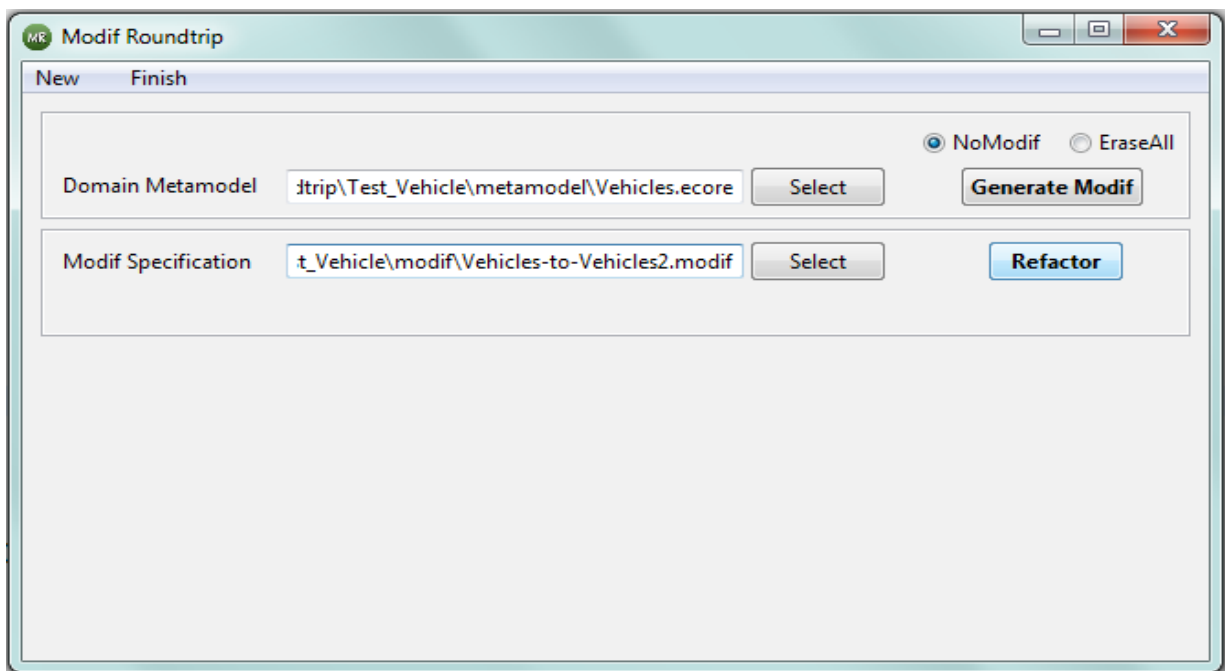
Main.java  NoModifVehicles.modif  Vehicles-to-Vehicles2.modif
- root vehicles to vehicles2
  Prefix vehicles to vehicles2
  URI "http://mde.ubo.vehicles" to "http://mde.ubo.vehicles2"

  class {
-   Root to Root {
      ref person to people bounds (0,-1) to (0,-1)
      ref vehicles to vehicles bounds (0,-1) to (0,-1)
      ref insurance to insurances bounds (0,-1) to (0,-1)
    };
-   Person to Person {
      ref vehicle to vehicle bounds (0,-1) to (0,-1)
    };
    PoliceInsurance to PoliceInsurance ;
    Vehicle to Vehicle ;
-   flatten hide EngineVehicle to EngineVehicle {
      ref insurance to insurance bounds (0,1) to (0,1)
    };
    Car to Car ;
-   flatten hide IdentifiedElement to IdentifiedElement {
      att identification to identification bounds (0,1) to (0,1)
    }
  }
}

```

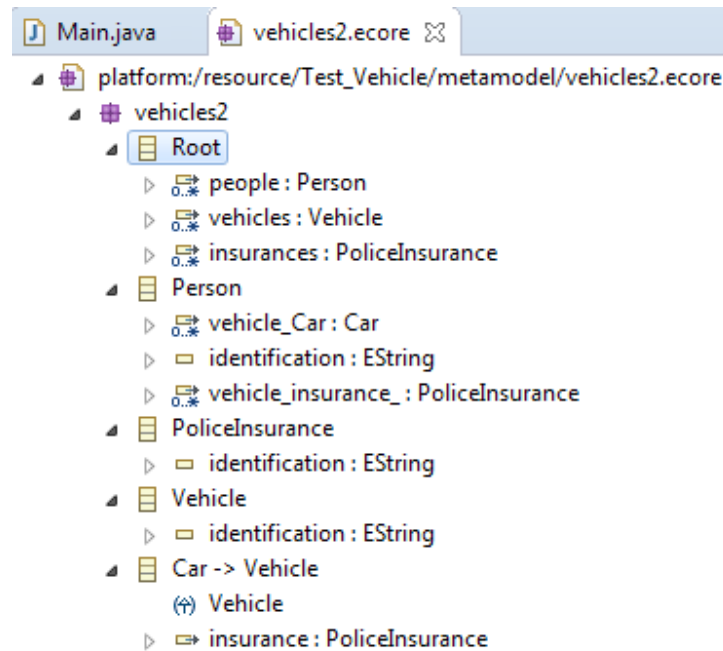
## Refactor

- In the ModifRoundtrip form, set the *Modif Specification* Vehicle-to-Vehicles2.modif
- Click on the **Refactor** button

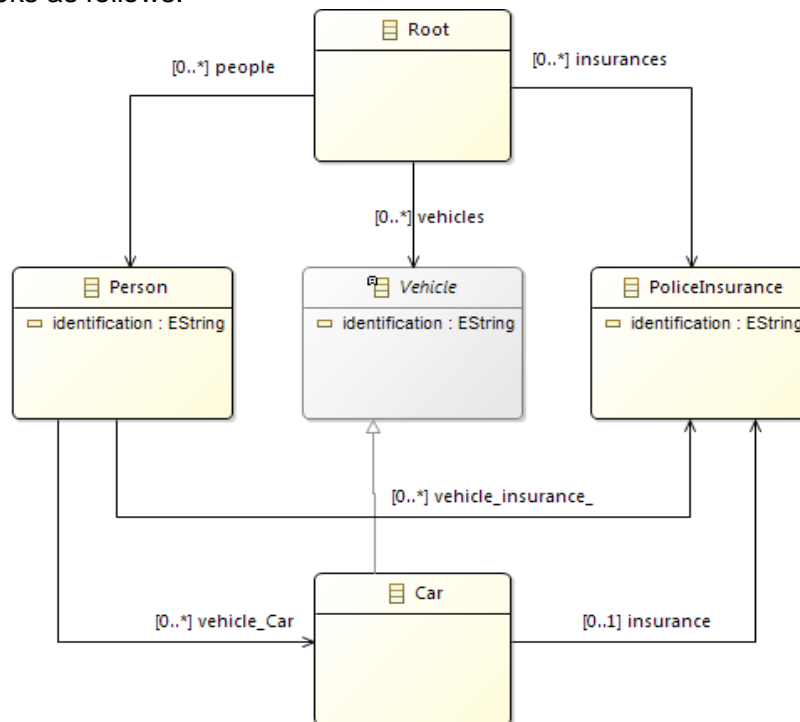




- Refresh the *Test\_Vehicle/metamodel* folder and you will notice that the file *vehicle2.ecore* is added. It will look as shown below:



Graphically it looks as follows:



Notice the following:

- The reference *person* has been remaned
- The reference *insurance* has been renamed
- The class *IdentifiedElement* disappeared and its attribute *identification* now exists in *Person*, *Vehicle* and *PoliceInsurance*
- The class *VehicleInsurance* no longer exists, but there is a new reference from *Person* to *PoliceInsurance*, and *Car* inherits from *Vehicle*

## **Congratulations**

**You have used Modif tools to generate a new ecore model by application of Modif operators on initial ecore model**

## **Enjoy Modif**

### **3. Contact**

You can report bugs to :

- **[babau@univ-brest.fr](mailto:babau@univ-brest.fr)**
- **[vallejoco@univ-brest.fr](mailto:vallejoco@univ-brest.fr)**