MAENAD

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Model-based Analysis & Engineering of Novel Architectures for Dependable Electric Vehicles

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Authors

Editor	E-mail
David Servat	David.Servat@cea.fr

Authors	E-mail

The Consortium

Volvo Technology Corporation (S) Centro Ricerche Fiat (I)

Continental Automotive (D) Delphi/Mecel (S) 4S Group (I)

MetaCase (Fi) Pulse-AR (Fr) Systemite (SE) CEA LIST (F)

Kungliga Tekniska Högskolan (S) Technische Universität Berlin (D) University of Hull (GB)

Revision chart and history log

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1 Introduction

This deliverable describes the modeling tool environment developed within the MAENAD project. It is based on the UML modeler Papyrus and the EAST-ADL profile developed for that tool. There are also extra plugins developed, which are described in D5.2.1 – MAENAD analysis workbench, see [1].

The installation of the tool and the profile will be explained and an empty EAST-ADL model is created. There will be also a more complete tutorial of the language in the project presentation material, which could be used as the next step, if the reader wants to develop a more complete EAST-ADL model.

The workbench of EAST-ADL consists of a customized version of the Papyrus UML modelling tool, which is developed by CEA in the context of the Eclipse MDT project – see [2]. This is done by a dedicated EAST-ADL palette, which allows for direct creation of EAST-ADL stereotyped elements in the model.

The Papyrus tool provides a UML2 implementation that fully conforms to the OMG standards:

Papyrus conforms to the XMI format for saving models;

Papyrus conforms to the UML standard semantically and graphically;

Papyrus conforms to the OMG Diagram Interchange (Di) standard to handle models graphical interoperability between tools.

To facilitate its extensibility, Papyrus is an Eclipse plug-in that uses other plug-ins such as UML2, EMF and GMF, ANTLR.

Papyrus 0.8.X implements the following diagrams of the UML2 standard:

Activity diagram

Class diagram

Composite diagram

Use Case diagram

Deployment diagram

State Machine diagram

Papyrus offers advanced functionalities for UML2 profiles support. Some of them are:

Profile diagrams

Hierarchical profiles

Complex typing of stereotype properties

Icons and shapes for stereotypes

Palette customization for applied profiles

Adding a popup menu to connect with an external tool

To create EAST-ADL entities, the user uses the dedicated EAST-ADL palette to create UML entities with the correct stereotypes applied to them. This feature is brought by a specific API which provides profile implementations (known as static profiles). This enables users to add specific functionalities associated to stereotypes, such as filters applied on list of selected elements, automatic creation and the like. For instance a model creation wizard is provided to help users have a well-configured model right from the start.

The EAST-ADL profile used in the first steps of the MAENAD project is based on the ATESST2 final profile – see [3]. Then after MAENAD M12, the profile will be MAENAD EAST-ADL profile for MARTE, described in D4.2.1 – see [4].

2 Installation

The Modeling workbench is provided for the MAENAD partners as a complete bundle ready to be used, including some examples, via the internal link:

http://maenad.eu/internal/Tooling/Papyrus/papyrus0.7.4eastadl2.1.9.zip

Publicly advertised sites to access the workbench will be available shortly after MS4, i.e first year of project.

The installation of the tool and the profile is explained, and an empty EAST-ADL is created. There will also be a more complete tutorial of the language in the project presentation material, which could be used as the next step, if the reader wants to develop a more complete EAST-ADL model.

Papyrus is based on Eclipse, and it can be used as a stand-alone RCP (Rich Client Platform), or on top of an existing Eclipse installation. This deliverable is based on the standalone version, there might be some small differences in the user interface compared with the plugin version.

Once unzipped the archive provides an executable: eclipse.exe, which launches an Eclipse application with a full Papyrus+EAST-ADL installation. The user is prompted with the choice of a workspace. You can select the workspace included in the bundle:

After unzipping the bundled archive, you get the following directory in Figure 3

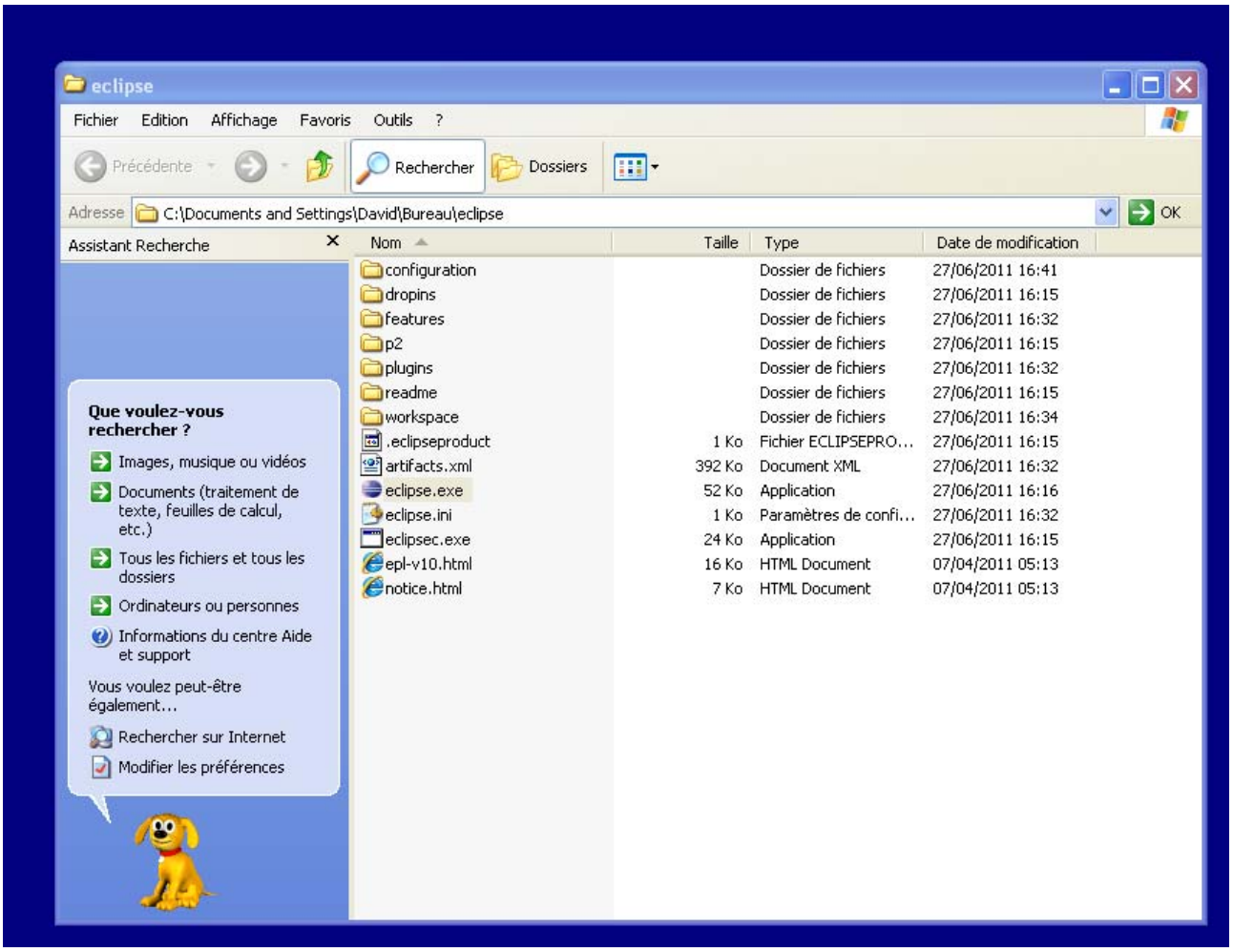


Figure 1: The bundled archive

After double-clicking on eclipse.exe, you are prompted with a workspace selection, i.e. a directory where projects are stored on the hard drive, choose the one proposed which contains an EAST-ADL example.

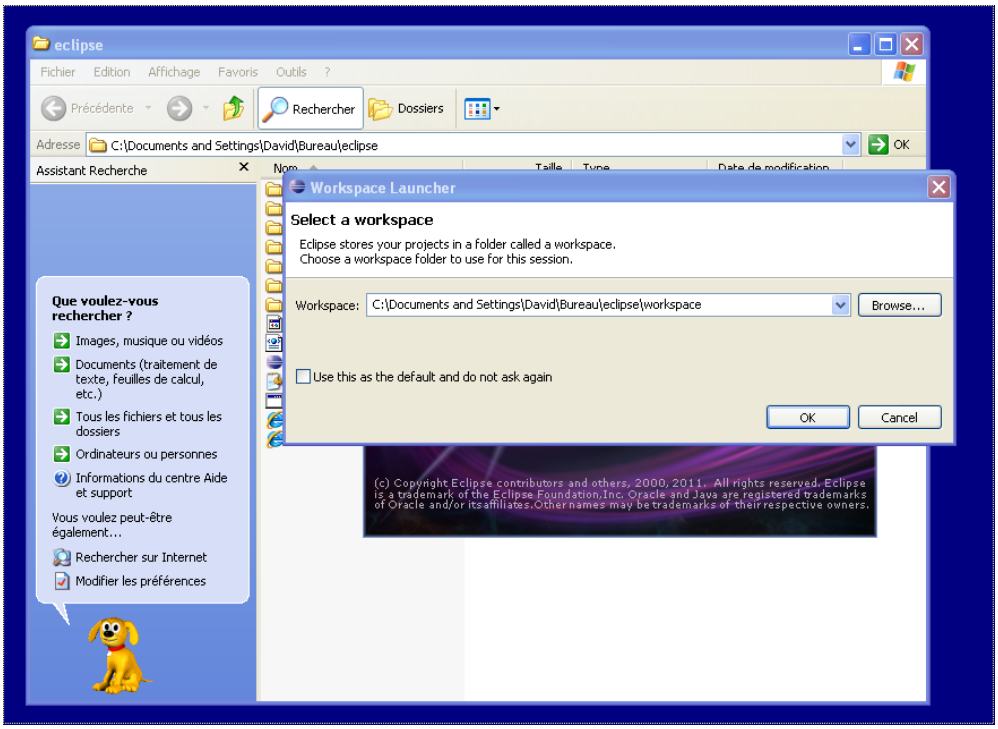


Figure 2: The workspace launcher

After a while, the Papyrus Environment will open with a sample EAST-ADL model loaded, see Figure 3. Note the different views: diagram view, model explorer view, property view and the dedicated palette for element creation. Just click on an element to pick it in the palette, then click in the diagram and it will be added.

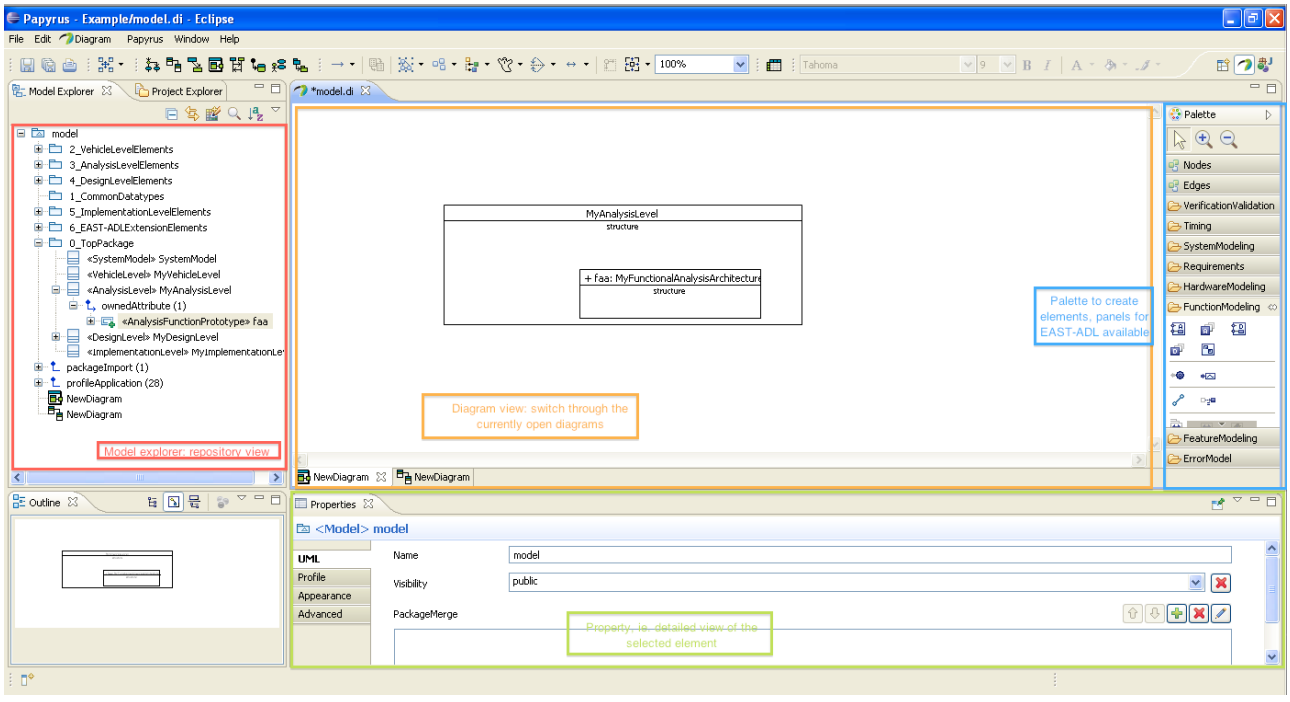
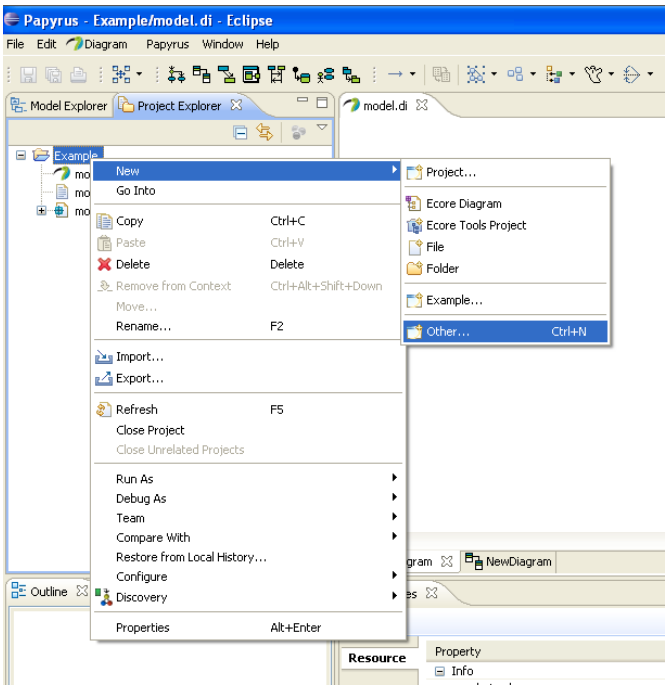
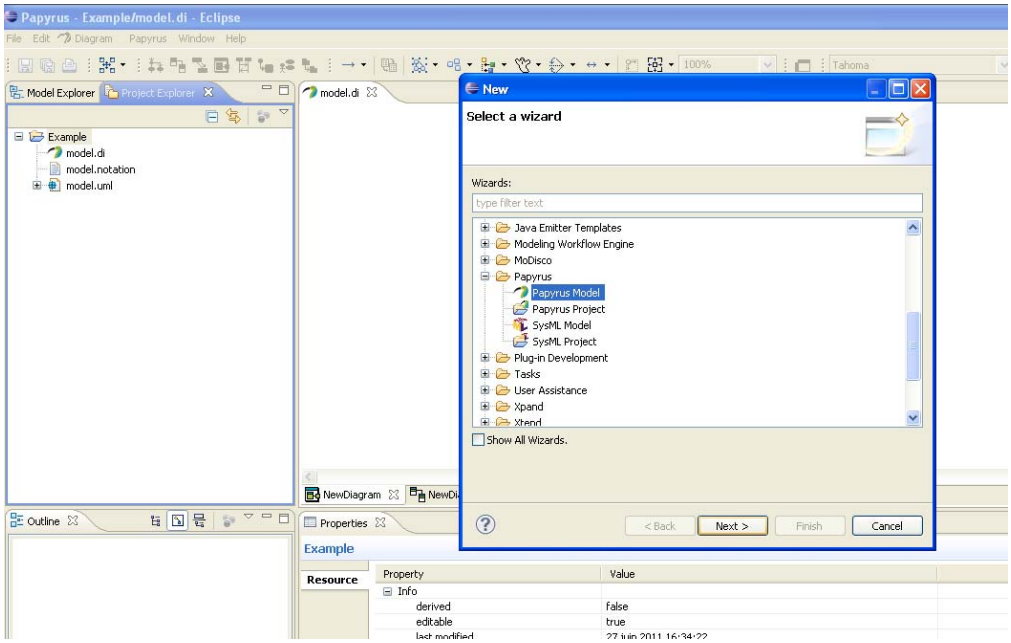


Figure 3: The most important views of a Papyrus model

In the navigator view, three files have been created, the .di file, the .uml file and the .notation file. The .di file is contains the graphical information and the .uml file is where all model data is stored. Papyrus is launched when you double-click on the .di file.

One can create a completely new model, by using the Papyrus creation wizard. In the navigator view, where files are shown, right click on the project and select New>Other, then Papyrus>Papyrus model. Choose a name, select UML file, then choose the diagrams you would like to be created and choose the EAST-ADL template for the model. A model, which has the same structure as the sample just shown above is created and the diagrams open. See the following set of Figure 4





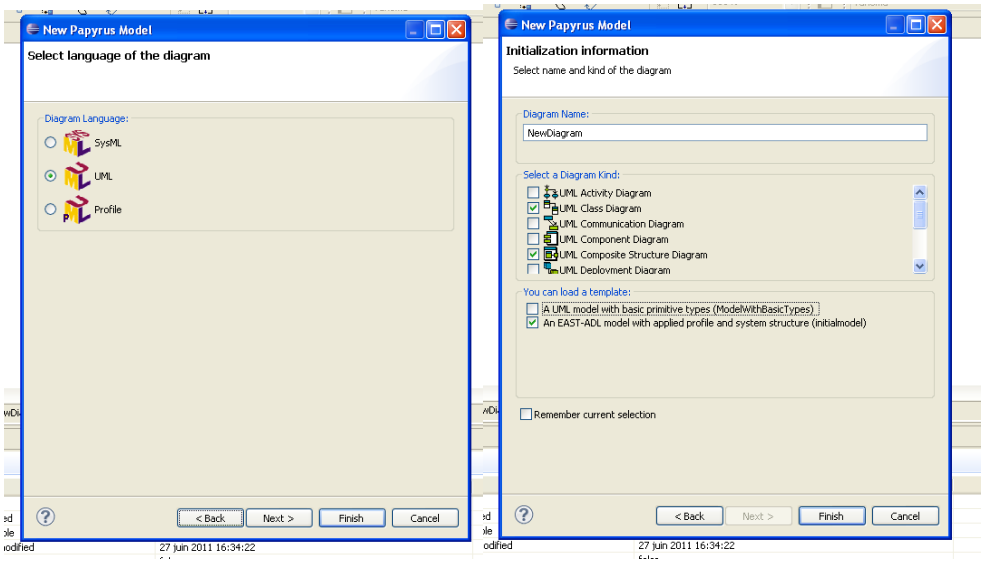


Figure 4: Steps in creating a model from the wizard

Note that the model is created with the correct structure, as suggested in the specification of the EAST-ADL language: a system model element containing one element per abstraction level. Each of the abstraction levels are further decomposed according to the specification. In addition, packages are offered for each abstraction level to organize elements efficiently, as shown in Figure 5.

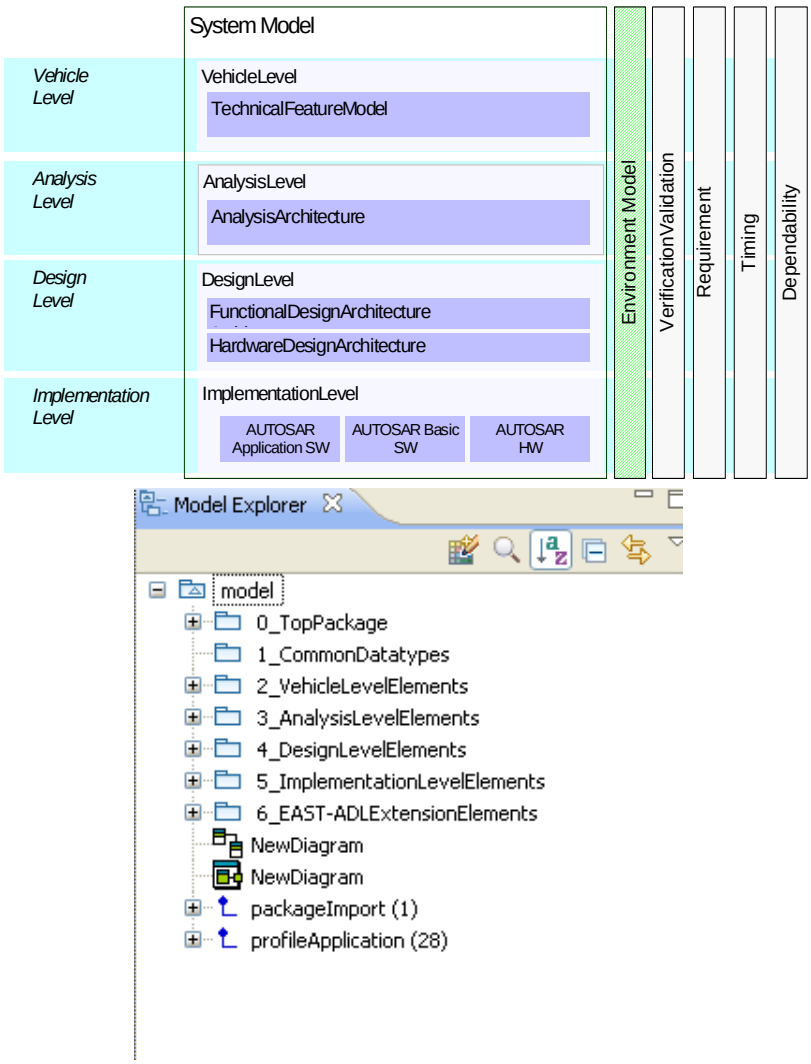


Figure 5: The outline window (below), and the corresponding EAST-ADL abstraction levels

Updates of this platform can be obtained at any time after this installation, thanks to Eclipse software updates, simply select Help>Check for updates. You'll be prompted with a list of potential updates of plugins installed in your configuration, a check for availability and restrictions will be performed. After a restart, you will have an updated platform.

Now the model is created, and we could start filling it out with models. There will be a tutorial on that as a part of the project presentation material.

3 References

[1] MAENAD Deliverable D5.2.1 MAENAD Analysis workbench, June 2011

[2] Papyrus MDT website, http://www.eclipse.org/modeling/mdt/papyrus/

[3] ATESST2 Deliverable D4.1.1 EAST-ADL2 Profile Specification, June 2010.

[4] MAENAD Deliverable D4.2.1 EAST-ADL profile for MARTE, august 2011