Advancing Traffic Efficiency and Safety through Software Technology phase 2 (ATESST2)

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## Revision chart and history log

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1 Introduction

This deliverable describes the tool environment developed within the ATESST2 project. This includes the UML modeler Papyrus, and the EAST-ADL profile developed for that tool. There are also plugins developed, which are described in D4.3.1. The installation of the tool and the profile is explained, and an empty EAST-ADL is created. There is 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. 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 Diagram Interchange (Di2) 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 GEF, ANTLR.

Papyrus 1.12.3 implements the following diagrams of 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 features is new compared to what the previous workbench offered in ATESST1 and results from the change of profile implementation: they are now supported as standalone profile (known as static profile), with a dedicated API. This enables users to add specific functionalities associated to stereotypes, such as filters, 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.
2 Papyrus Installation and Update for related profiles.

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 stand-alone version, there are some small differences in the user interface compared with the plugin version.

1. Download the latest standalone version of Papyrus from http://www.papyrusuml.org/scripts/home/publigen/content/templates/show.asp?P=114&L=EN&SYNC=Y

2. After installation run Papyrus from “Start-> All Programs -> Papyrus UML -> Papyrus”. The window in Figure 1 will appear.

![Workspace Launcher](image)

**Figure 1: The workspace launcher**

3. Click on Browse and select a directory where you want to save the work later on.

4. The Papyrus Environment will open which looks like Figure 2. Note the different views: The Main Window, the Property view, the Navigator view, and the Outline view.

![Papyrus Environment](image)
Figure 2: The most important views of a Papyrus model

5. Update Papyrus for EAST-ADL, MARTE and other profiles by clicking on help Help->Software Updates->Find and Install (Figure 3)

Figure 3: Install plugins, including the EAST-ADL profile.
This will open a new window as shown in Figure 4.

![Figure 4: Select “Search for new features to install”](image)

6. Select “Search for new features to install” and click “Next”. This will lead to a window shown in Figure 6.

![Figure 5: The available update sites](image)
7. Click on “New Remote Site” and in the new window shown in Figure 6. Give a name for example “Papyrusweb” for the profile locations and add the following website in the URL field.

   http://www.papyrusuml.org/home/liblocal/docs/updates/papyrus-extensions

![New Update Site](image)

**Figure 6: Create a new update site, to find the EAST-ADL profile**

8. Click on OK.

9. As shown in Figure 5, make sure that only the new location is selected and then click on finish.

10. In the new “Updates” window select all possible profiles as shown in Figure 7 and click on “Next”. Note that old versions of the profile are available, by unchecking the “Show the latest version of a feature only” box.

![Updates](image)

**Figure 7: Select all these profiles.**

11. Accept the terms in the new window and click on “Next” and finally click on “Finish”.

   **NOTE:** Ignore the message about unverified feature and install all.

You are now ready to develop your first model, after the restart of Papyrus.
3 Getting Started

A Papyrus model is organized using projects (like all Eclipse models). A project can contain many different models and files of different kinds.

1. Create a new project. “File -> New -> Project” as shown in Figure 3.

![Figure 8: Start a new project](image)

2. Write a suitable name for the project, for example MyFirstEST, and click on “Finish” (Figure 9).

![Figure 9: Select an appropriate name for your project](image)
3. Create a new EAST-ADL model (Figure 10).
   a. File --> New --> Other
   b. Papyrus/EAST-ADL model --> Next

![Figure 10: Two steps to create a new EAST-ADL model](image)

4. Select the project folder that you just created i.e. MyFirstEAST and then click on “Finish”. The resulting “Navigator” and “Outline” views are shown in Figure 11.

![Figure 11: An empty EAST-ADL model inside your project](image)

5. In the navigator view, two files have been created, the .di2 file and the .uml file. The .di2 file is the graphical interface to the .uml file, where all model data is stored.
6. Click on the .di2 file. The diagram in Figure 12 will show the outline window, and the EAST-ADL abstraction levels, which are created automatically. Also note that the VehicleFeatureModel is not created, this will be our first task.

![Diagram showing EAST-ADL abstraction levels]

**Figure 12:** The outline window (below), and the corresponding EAST-ADL abstraction levels
7. In Figure 13 the arrow to access the palette providing direct access to EAST-ADL elements is displayed. These elements are UML elements with assigned stereotypes. They can also be created manually by inserting UML elements and applying EAST-ADL stereotypes.

Figure 13: The arrow used to hide and show the palette

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