

Papyrus, current status and perspectives

Neptune 2001



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- **Introduction**
- **Papyrus Architecture**
- **Editors & tooling**
- **Build a DSML with Papyrus**
- **Conclusion**

- **CEA LIST**

- Arnaud Cuccuru, Sebastien Gerard, Camille Letavernier, Vincent Lorenzo, Ansgar Radermacher, Rémi Schneckenburger, David Servat, Yann Tanguy and Patrick Tessier.

- **ATOS**

- Raphael Faudou, Tristan FAURE, Vincent Hemery, Thibault Landre, Emilien Perico and Mathieu Velten.

- **LIFL**

- Cedric Dumoulin

- **Supporters (in alphabetical order):**

- AIRBUS, ATOS, CEA, Ericson and Esterel Technologies (<http://www.listerel.org/>)

Key features of Papyrus

- Papyrus is a Modelling::MDT component
 - lead : S. Gérard (CEA LIST)
 - <http://www.eclipse.org/papyrus>
- Papyrus provides a complete graphical editor for both UML and SysML standards based on the MDT::UML2 component for its repository.
- Papyrus addresses the two key features expected from a UML2 graphical editor: modeling and profiling.
- Papyrus is highly customizable and extensible enabling DSML definitions based on the standard UML profile mechanism!



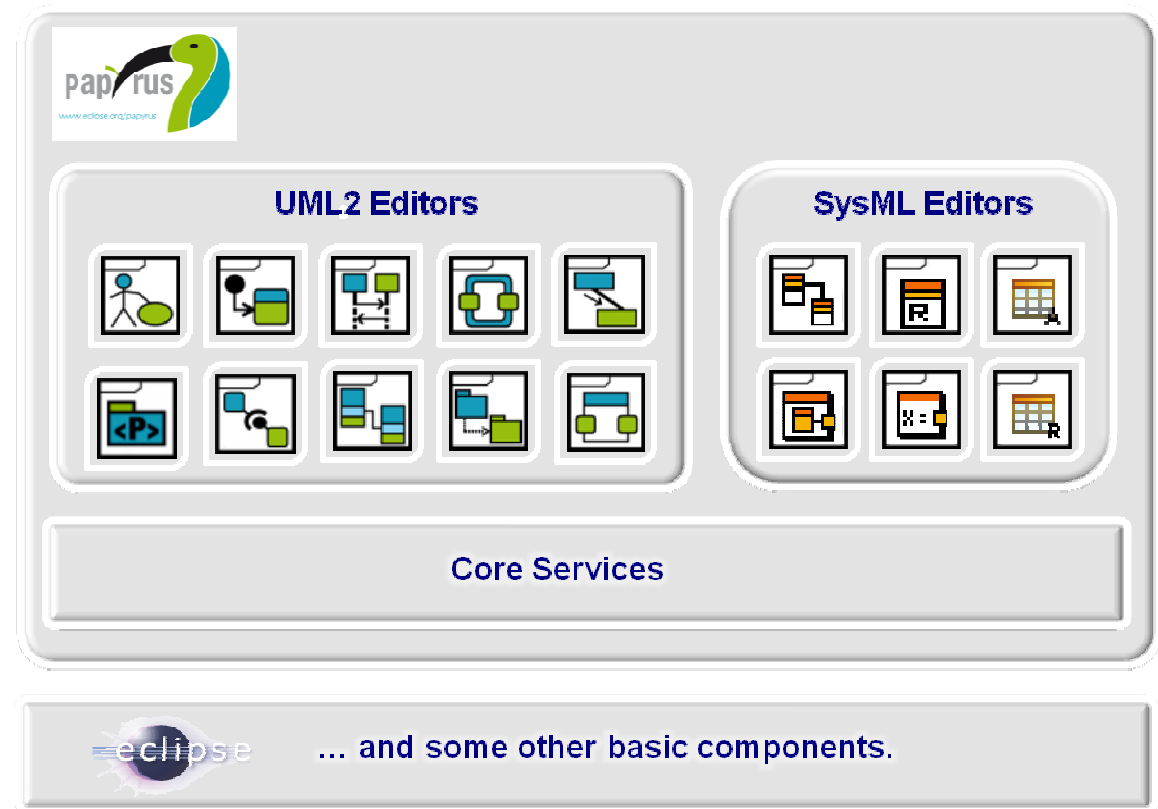
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- **Eclipse based as usual...**

- Based on well known Eclipse modeling components
 - EMF, GMF, UML2, EMF Facet, xText...

- **... built as an integration platform for multi-model editors**

- Supporting either graphical-, tabular- or text-based editors
- Supporting several frameworks for editor design
 - Available connectors for: GMF, GEF and xText
 - Extensible to other frameworks: e.g., Graphiti



Outlines of the Papyrus perspective

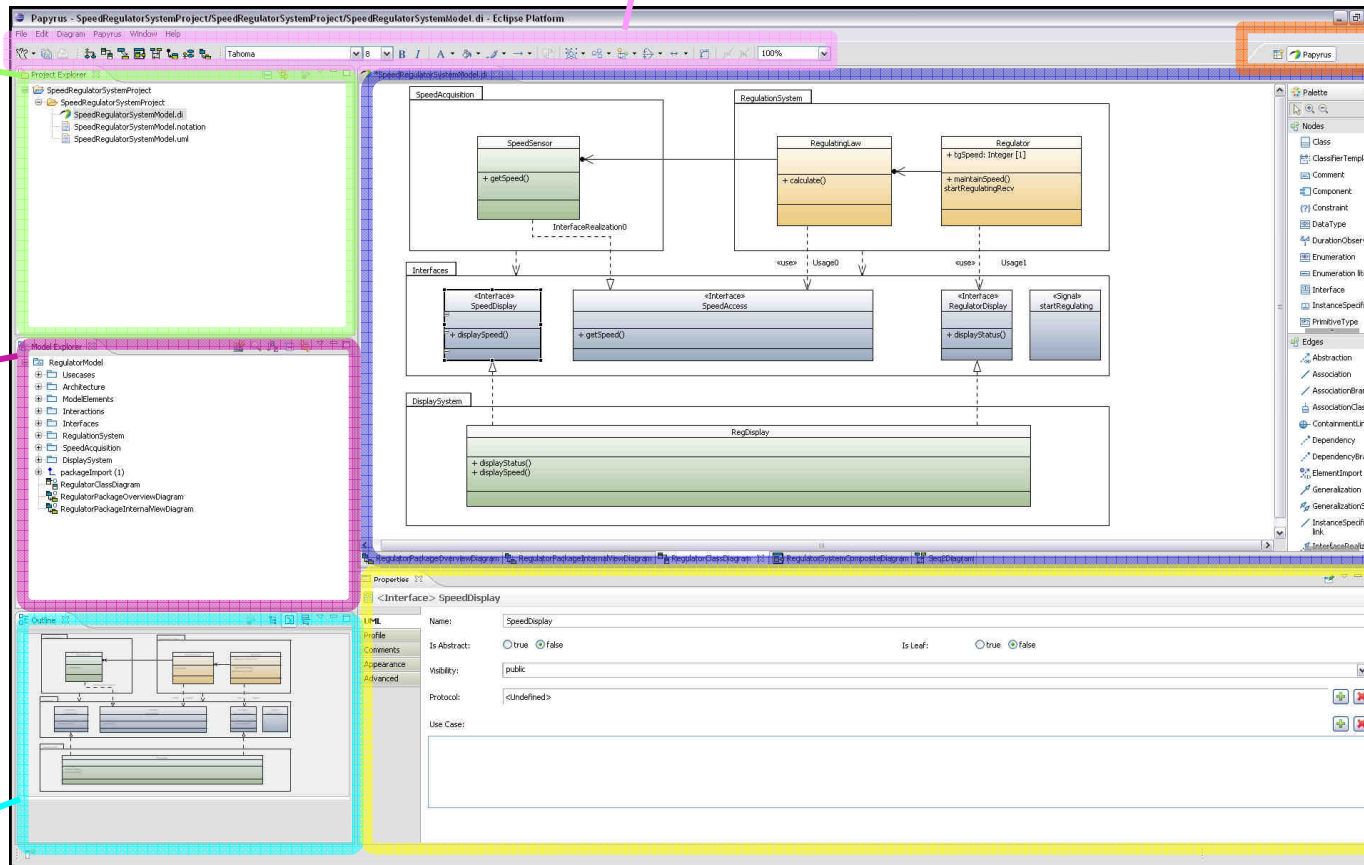
Project explorer: used to manage Papyrus projects at file system level.

Main toolbar: diagram creation, graphical editing (align, distribute...), show /hide, ...

Perspective: switch the modeling context, define windows (eclipse views) arrangement, define the list of available diagrams, define the available menus and toolbars.

Model editors: model editor enabling to edit models through a given modeling language.

Property view: form-based model editor enabling to view & edit model element properties.



Outline view: provide overview of the model (read only).

Model explorer: tree-based model editor covering the whole model.

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- **Graphical-based editors**

- **UML2**

- » Support for Class, Composite Structure, Deployment, Component, Use Case, Sequence, Statemachine, Activity and Profile diagrams

- **SysML**

- » Support for requirements, BDD, IBD and Parametric diagrams

- **Textual-based editors**

- **Extension point to embed textual editors within Papyrus to edit partially a diagram**

- » E.g.: Attributes or Operation of Classes, Port of Composite Structure, State of Statemachine.

- **Framework for using the Xtext technology**

- **Miscellaneous**

- » Textual editor for ALF (“Action Language for fUML”)

- » Textual editor for VSL in the MARTE plug-in of Papyrus

- **Table-based Editors**

- **Based on NatTable and customizable via EMF Facet**

- **Generic Table Editor allowing to show any kind of element including its stereotypes and related properties.**

- **Two customizations for SysML:**

- » Requirement and Allocation Table Editors

- **Validation**

- Based on EMF Validation
- Integrated within Papyrus GUI

- **Compare and merge**

- Based on EMF Compare
 - » Specialized for UML models (specific case of the Stereotypes!)
- Integrated within Papyrus GUI

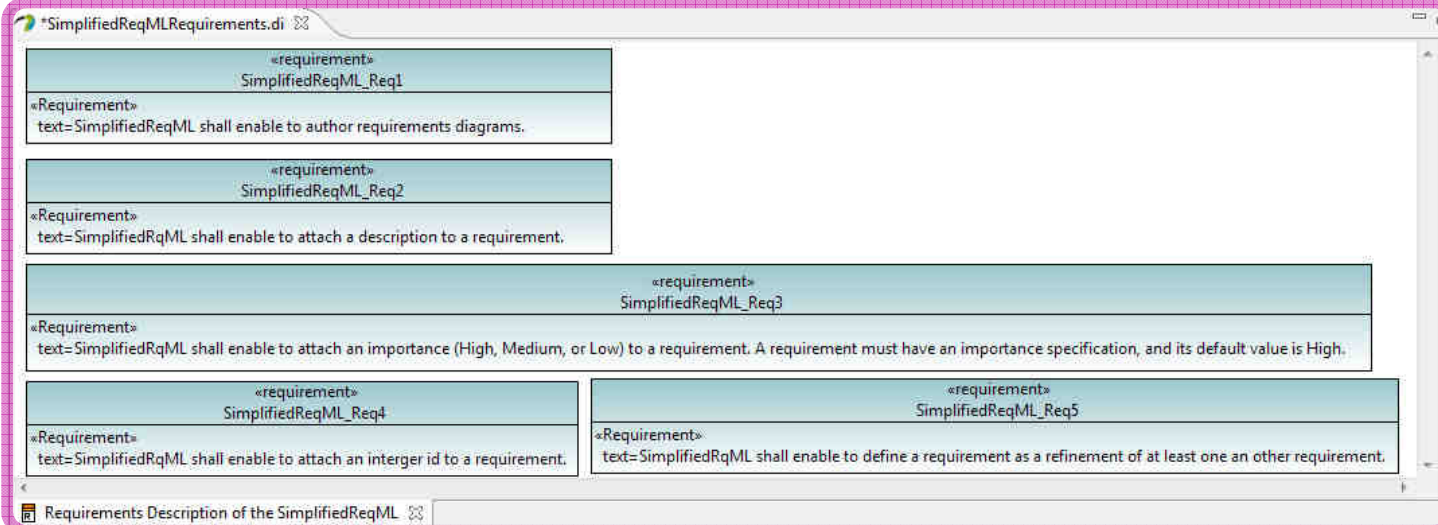
- **Documentation generation**

- Integration of the Gendoc2 component of TopCAGED
- Enable generation of ODT and DOCX documents
- Available via the market place of Eclipse:
 - » <http://marketplace.eclipse.org/>

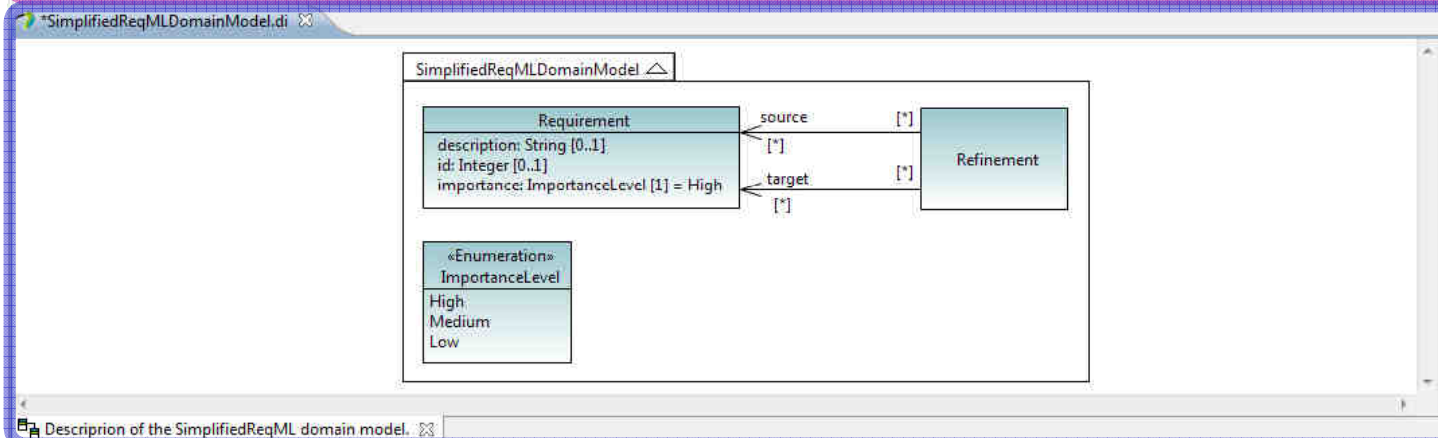
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- **Based on UML profile mechanism**
 - UML profile are used to design the language on a UML base.
 - » Define the abstract syntax of the Language
 - » Have a default notation used to annotate UML model elements: << StereotypeName >>,
 - Include possible specific icons!
- **Based on following Papyrus customization facilities:**
 - Specific Properties View
 - Specific Model Browser
 - Specific Palettes in Papyrus “standard” editors
 - Specific Editors
 - » Brand new editors (based on either EMF or GMF technologies)
 - » Inherited Diagram Editors
 - » Custom Tabular Editor
 - » Specific textual editor (based on Xtext)
 - Specific model wizards
 - Specific validation rules

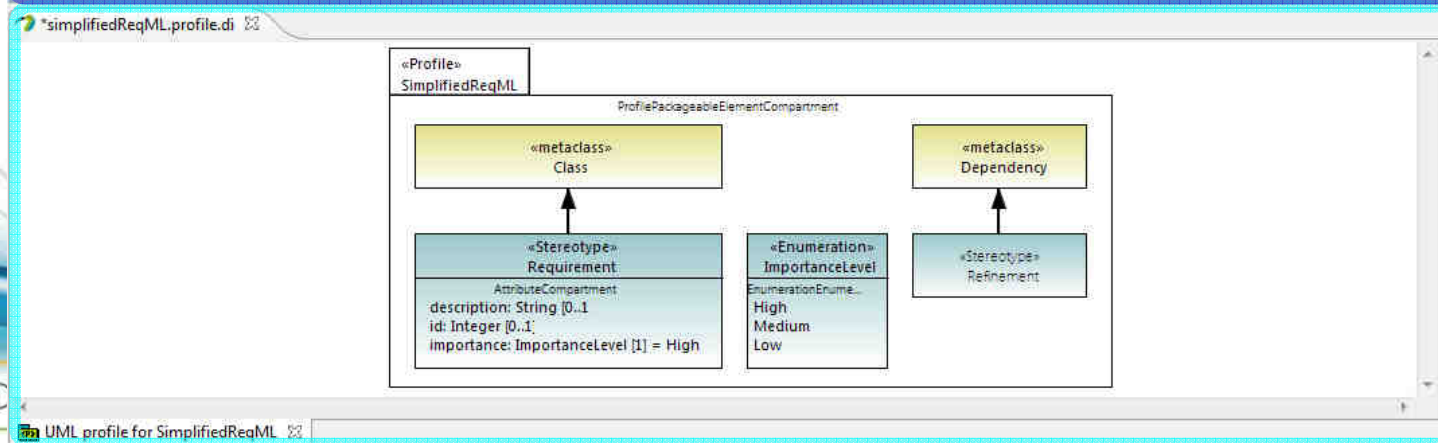
Models of the SimplifiedReqML design process



SysML Requirement diagram for SimplifiedReqML.



Domain model of SimplifiedReqML conforming its aforementioned requirements.

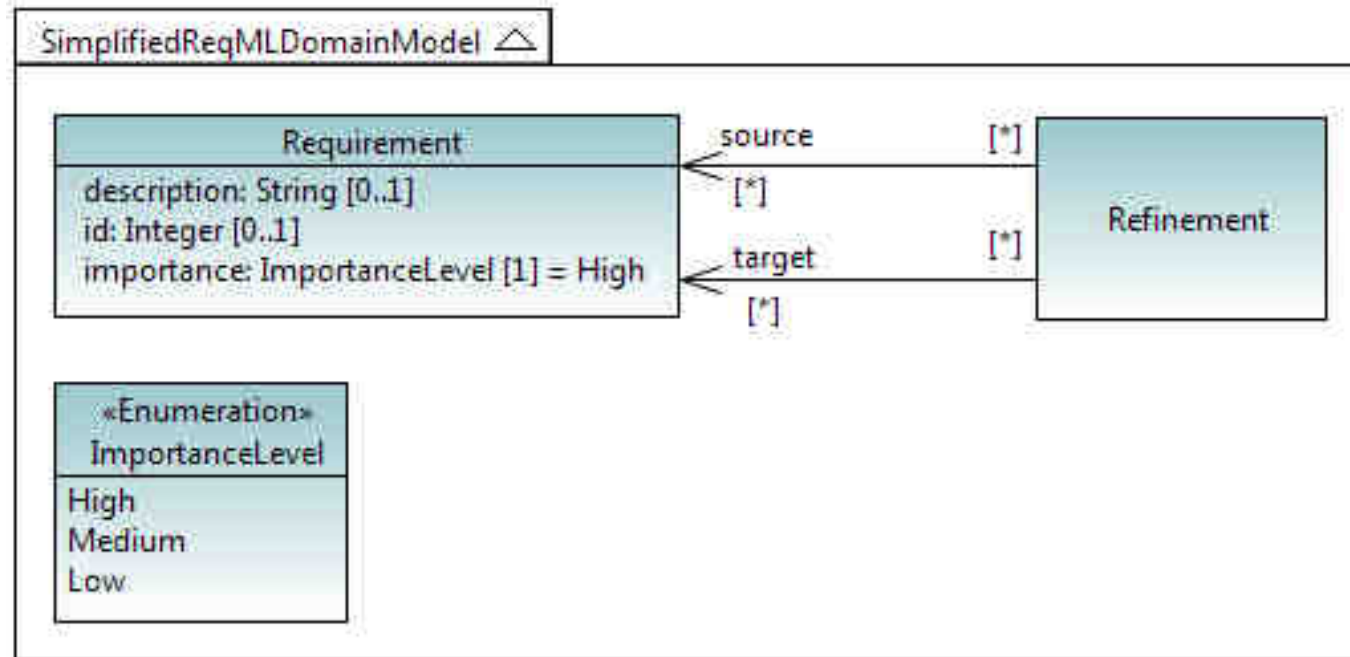


UML Profile design of SimplifiedReqML forming aforementioned domain model.

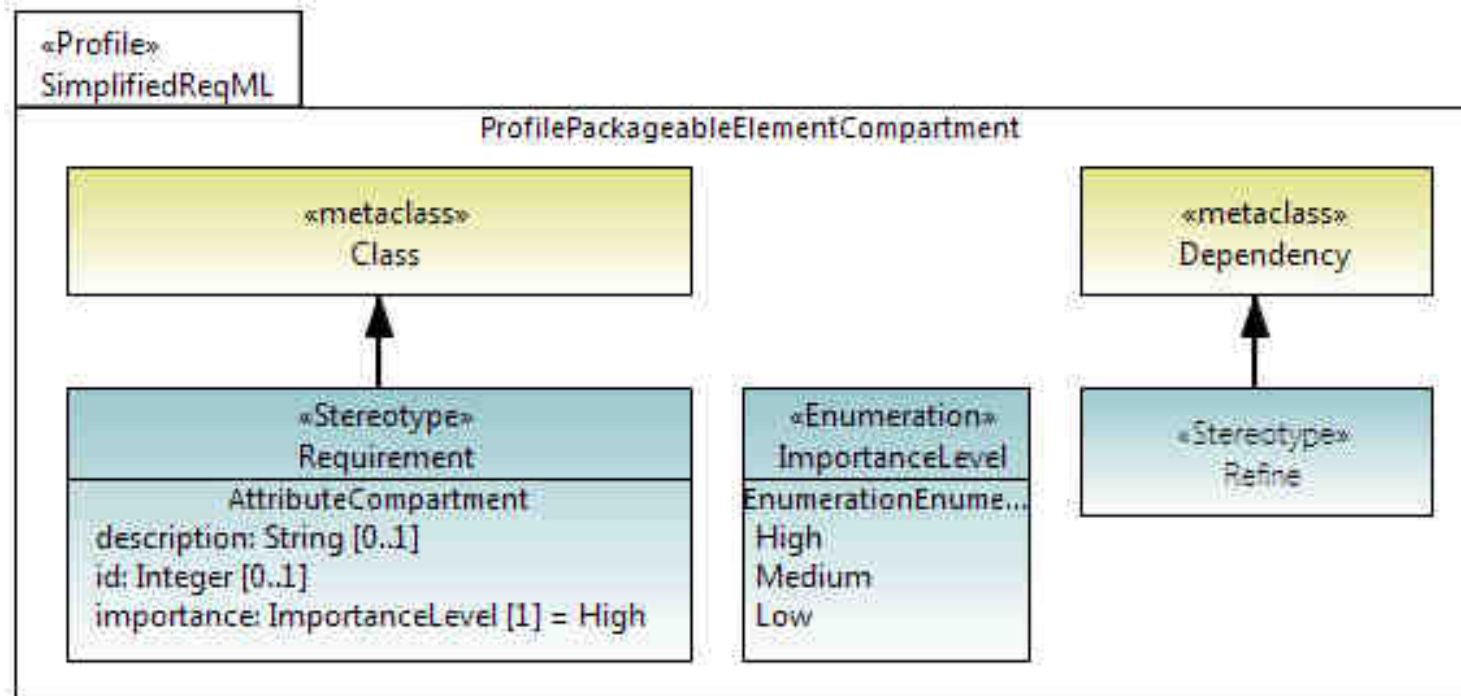
SysML requirements diagram for SimplifiedReqML

«requirement» SimplifiedReqML_Req1	«Requirement» text= SimplifiedReqML shall enable to author requirements diagrams.
«requirement» SimplifiedReqML_Req2	«Requirement» text= SimplifiedReqML shall enable to attach a description to a requirement.
«requirement» SimplifiedReqML_Req3	«Requirement» text= SimplifiedReqML shall enable to attach an importance (High, Medium, or Low) to a requirement. A requirement must have an importance specification, and its default value is High.
«requirement» SimplifiedReqML_Req4	«Requirement» text= SimplifiedReqML shall enable to attach an interger id to a requirement.
«requirement» SimplifiedReqML_Req5	«Requirement» text= SimplifiedReqML shall enable to define a requirement as a refinement of at least one an other requirement.

Domain model of the SimplifiedReqML



Profile diagram of the UML profile for SimplifiedReqML



View of the SimplifiedReqML tool without Papyrus customization. 17

Papyrus - SimplifiedReqMLExamples/SimplifiedReqML_Example1.di - Eclipse Platform

File Edit Diagram Papyrus Window Help

Segoe UI 9 100%

Model Explore Project Explore

SimplifiedReqML_Example1

- MyFirstRequirement [1]
- MySecondRequirement [2]
- MyThirdRequirement [3]
- Refinement0
- MyReqDiagram

Table Context : SimplifiedReqML_Example1 IsSynchronized : ☐ true ☒ false

Table Description : Table Description

	[Label]	id	description
1	MyFirstRequirement [1]	1	Description of the first requirement.
2	MySecondRequirement [2]	2	Description of the second requirement.
3	MyThirdRequirement [3]	3	Description of the second requirement.

MyReqDiagram RequirementSimplifiedSysMLTable

Outline

- platform:/resource/SimplifiedReqMLExamj
- platform:/resource/SimplifiedReqML/simp
- platform:/resource/SimplifiedReqMLExamj
- platform:/resource/SimplifiedReqMLExamj
- pathmap:/UML_LIBRARIES/UMLPrimitive1
- pathmap:/UML_METAMODELS/UML.met
- pathmap:/UML_PROFILES/Ecore.profile.ur
- pathmap:/UML_PROFILES/Standard.profil

Properties

<<requirement>> <Class> MyFirstRequirement

SimplifiedReqML Description Description of the first requirement.

Profile

Comments

Appearance Requirement id 1

Advanced Importance* High

- **Next major release -> 0.8.0 (Mid-July)**
- **Current main concerns:**
 - **Stability**
 - **Usability**
 - **Continue to improve customizability and extensibility**
 - » ... and complete with user-friendly configuration tool (Papyrus DSL Workbench)
- **Contributions and feedback are welcomed!**
 - **Bugzilla**
 - » <http://dev.eclipse.org/svnroot/modeling/org.eclipse.mdt.papyrus>
- **Information**
 - **Papyrus Eclipse forum**
 - » <http://www.eclipse.org/forums/eclipse.papyrus>
 - **Web pages:**
 - » For users: <http://www.eclipse.org/papyrus>
 - » For designers: <http://wiki.eclipse.org/MDT-PAPYRUS>

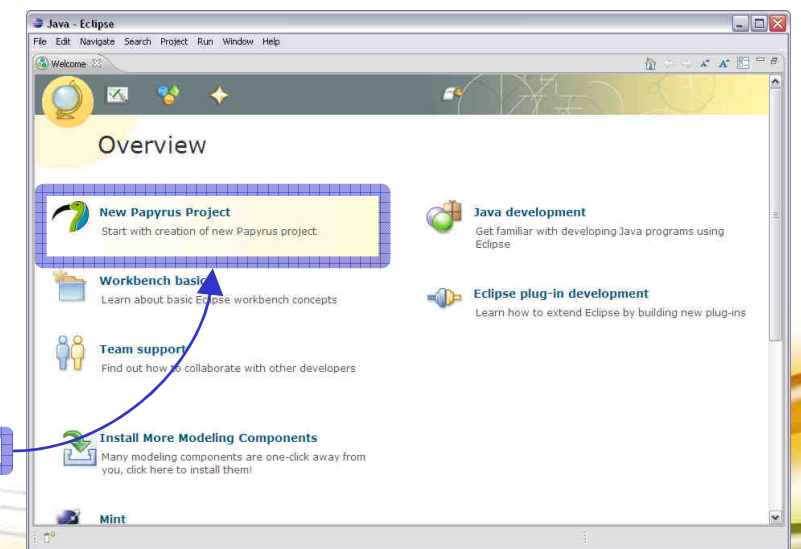
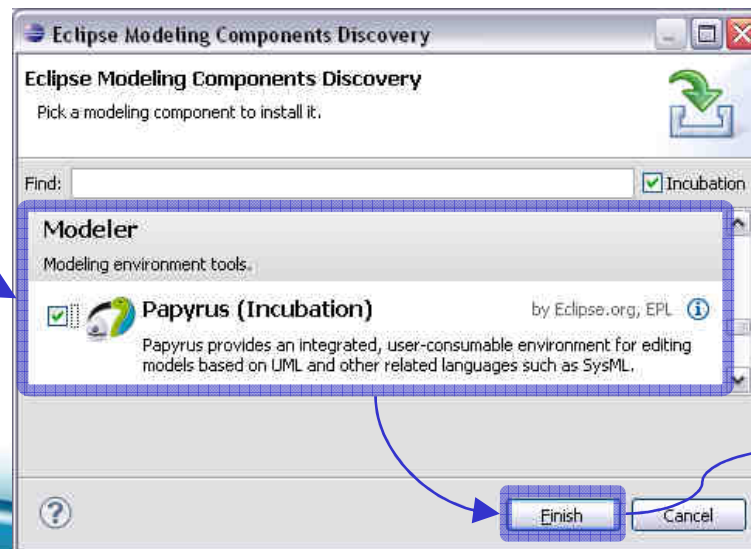
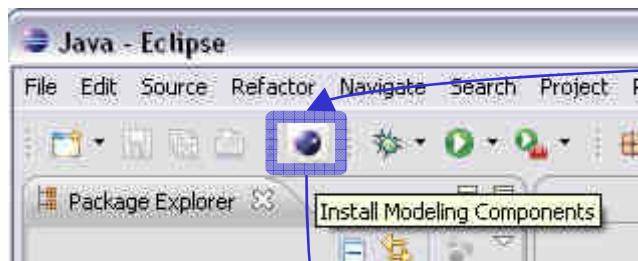
Tutorials

- A slide-ware tutorial on Papyrus usage for starters (2010-10-01).
- A tutorial on Papyrus sequence diagram editor (2010-10-01).
- A tutorial on Papyrus activity diagram editor (2010-10-14).

Contact : sebastien.gerard@cea.fr (Papyrus project leader)

- Via the standard Eclipse Modeling Platform

- Download the Eclipse Modeling Platform
 - » Helios: www.eclipse.org/downloads
 - » Indigo: Indigo: <http://download.eclipse.org/releases/indigo/>
- Unzip the downloaded file and start Eclipse.exe,
- Launch the Modeling discovery site update,
- Check Papyrus and start installation.



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Demo & Questions ?

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