Tooling with EAST-ADL : Overview

Outline, tooling with EAST-ADL

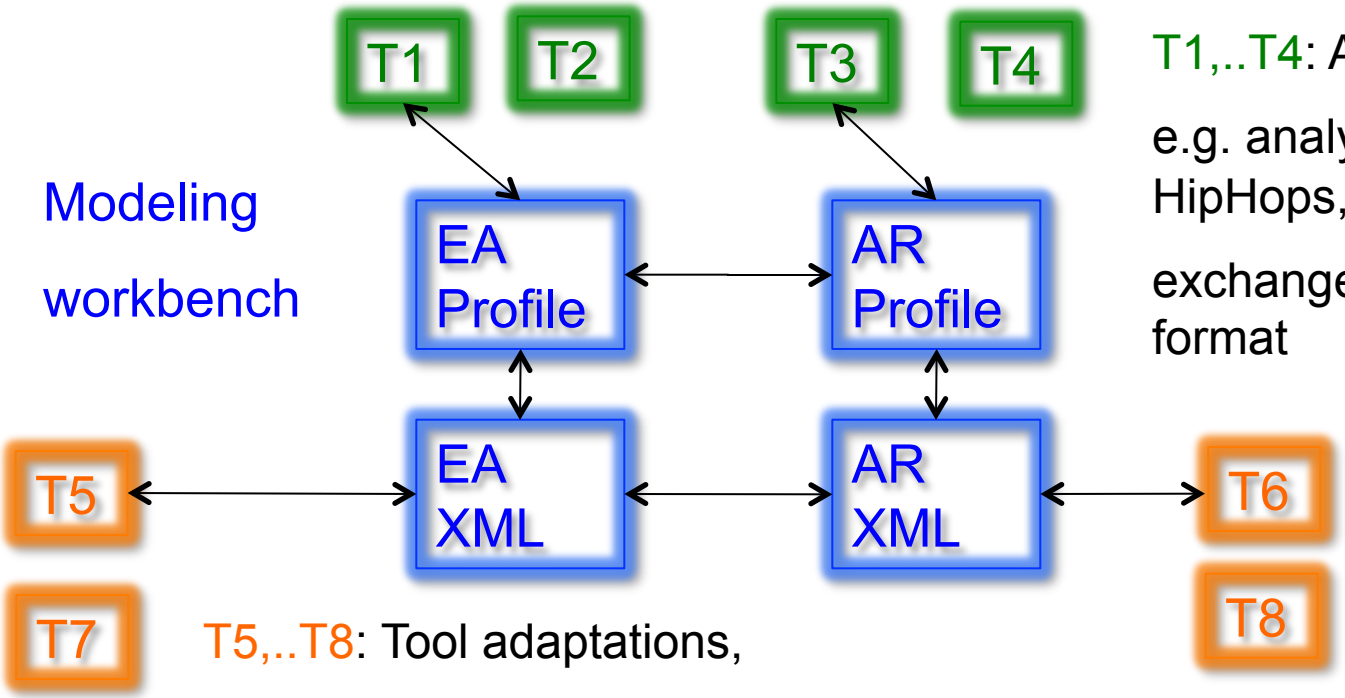
- Modeling workbench
  - UML-modeling with Papyrus and EAST-ADL profile
- Analysis workbench
  - A set of extra plugins to deal with specifics
- Tool adaptations
  - MetaEdit+
  - System Weaver

Modeling workbench and tool organization

Modeling workbench: provides core modeling functionalities + formats,

mainly UML-profile based+ extra XML format with additional tools

Various entry points are foreseen: either to/from UML+profile or to/from XML



T1,..T4: Analysis workbench

e.g. analysis plugins, bridge to HipHops, etc.,

exchange based on UML-profile format

T5,..T8: Tool adaptations,

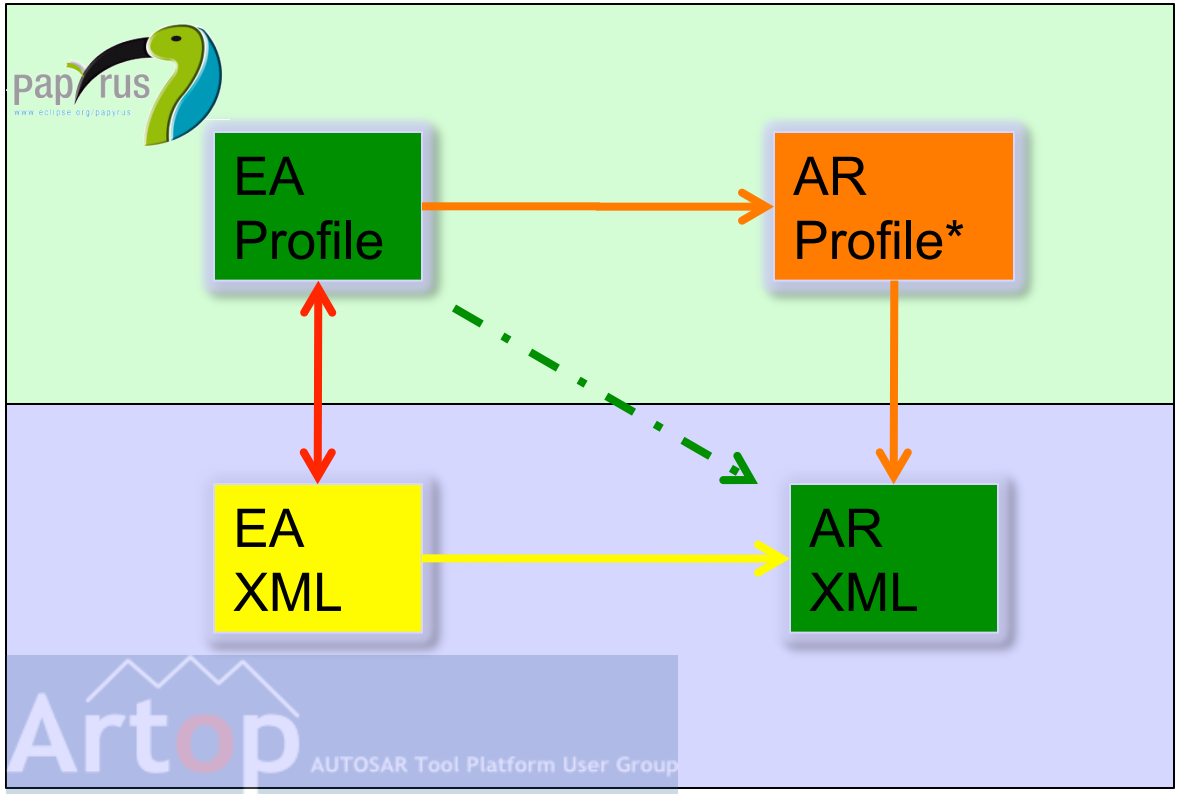
e.g MetaEdit+, SystemWeaver, etc.

XML-based exchange (EAXML or ARXML)

Detailed view of the core modeling workbench

UML+Profile front-end is Papyrus MDT

XML front-end is ARTOP



Green is available

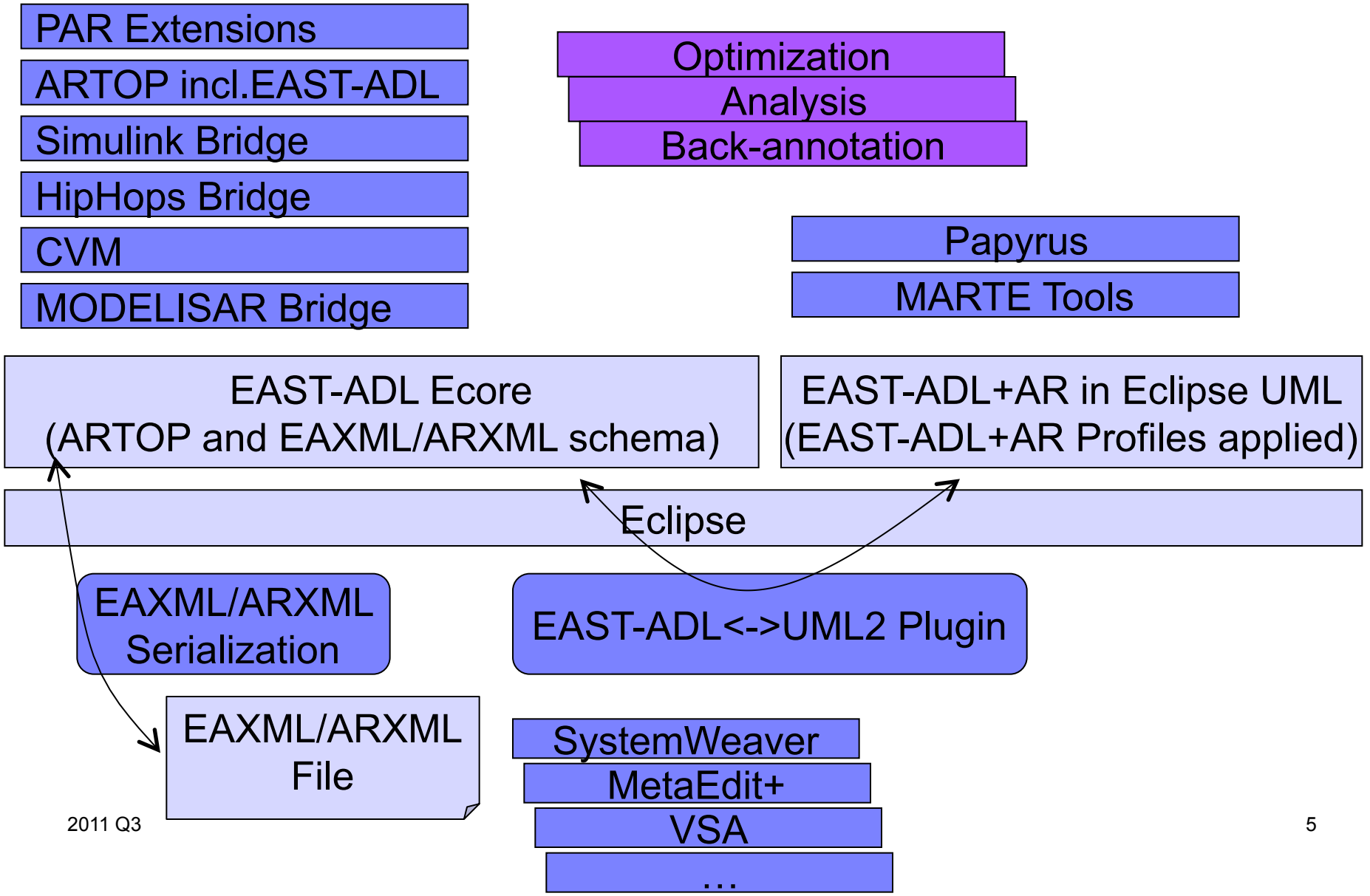
Orange restructuring of AR Gateway (see MAENAD analysis workbench): in addition to EA Profile -> AR XML (dashed green link), we have a two-step transformation relying on AR profile

-Yellow using ARTOP extensions to provide dedicated editor for EAXML and bridge from EAXML to ARXML

-Red is bridge from EA profile to EAXML: joint effort planned for year 2

* restricted coverage of AR, to be defined

Satellite plugins and background techno



Papyrus UML tool for EAST-ADL

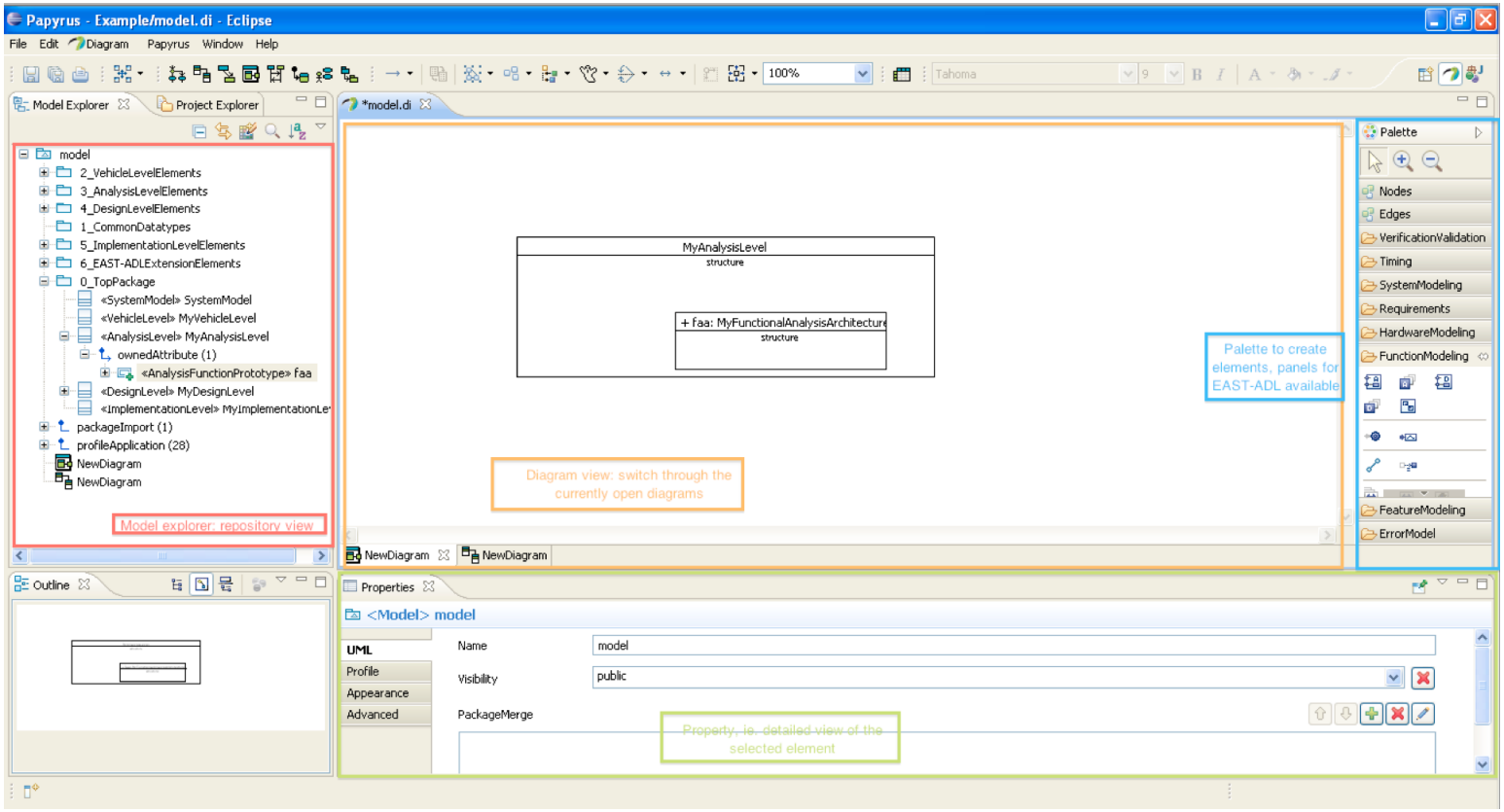
Now an Eclispe MDT project

- Eclipse UML2 compliance
- Full respect of the UML2 standard as defined by the OMG
- Full respect of the DI (OMG Diagram Interchange) standard
- Extendable architecture of Papyrus that allows users to add new diagrams, new code generators, etc.
- Profile development support

Ask MAENAD contact for :

- Complete zip bundle, ready to use
- Tutorials for modeling, plugin development, etc. available

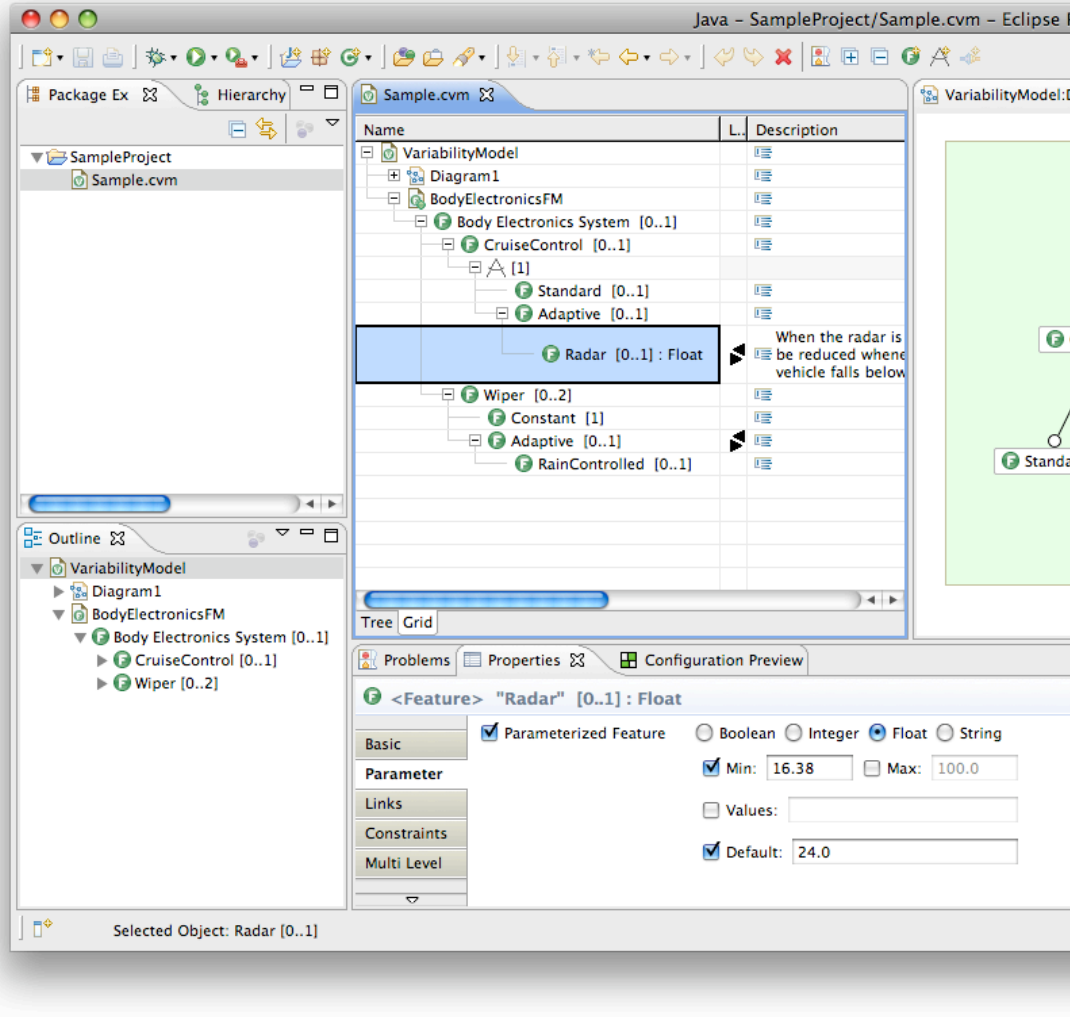
The most important views of a papyrus model

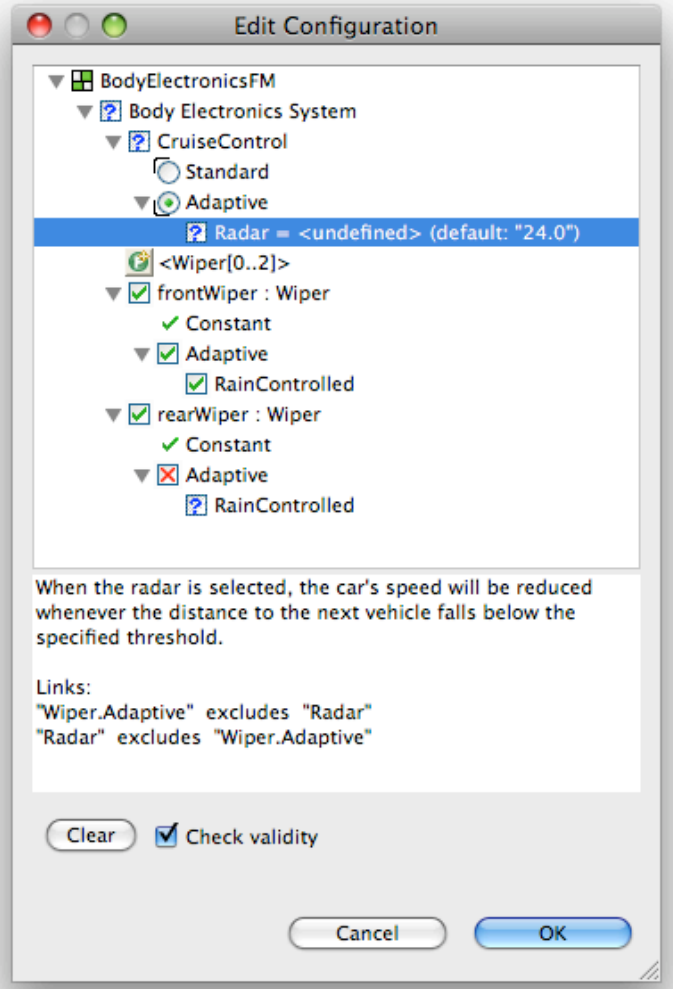


MAENAD Analysis workbench (preview)

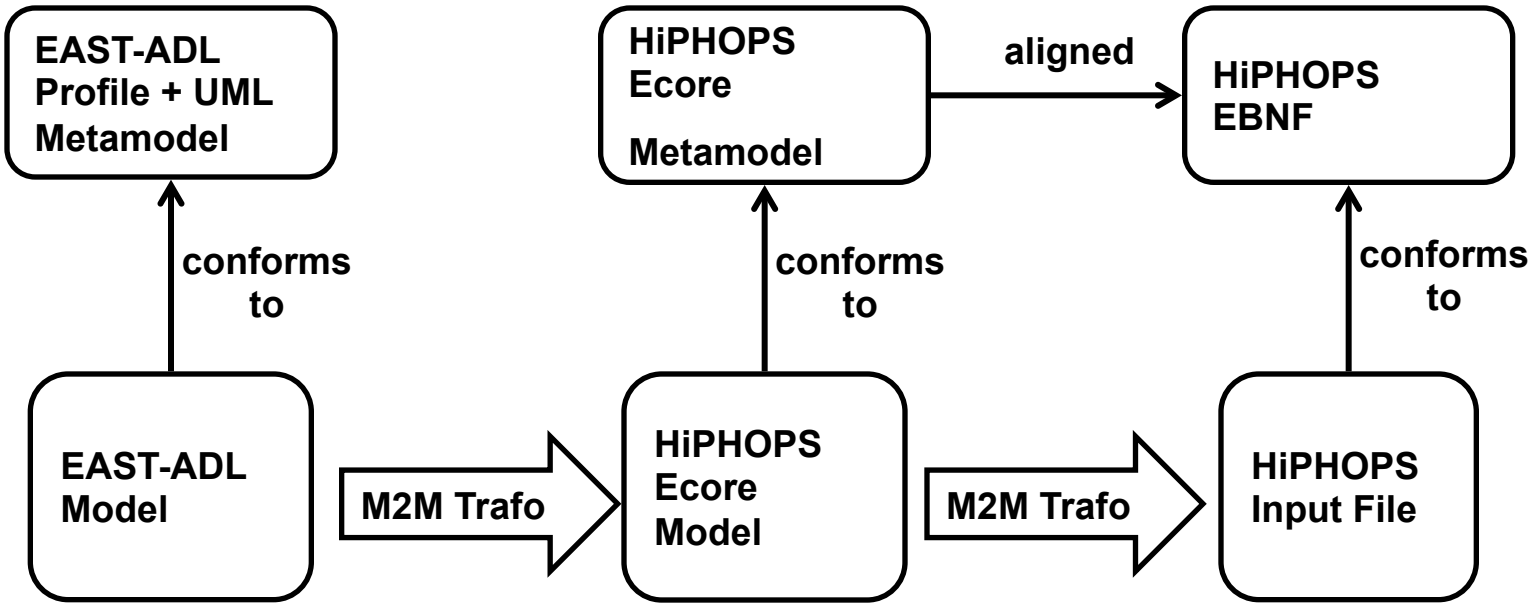
- A set of dedicated plugins to deal with
  - Modeling issues:
    - e.g. Feature/Variability
  - Model transformation to/from analysis tools
    - e.g. Fault tree analysis with HipHops
  - Model transformation for other design steps
    - e.g. Autosar architecture generation
- ✓ See dedicated concept presentation

Feature/Variability modeling



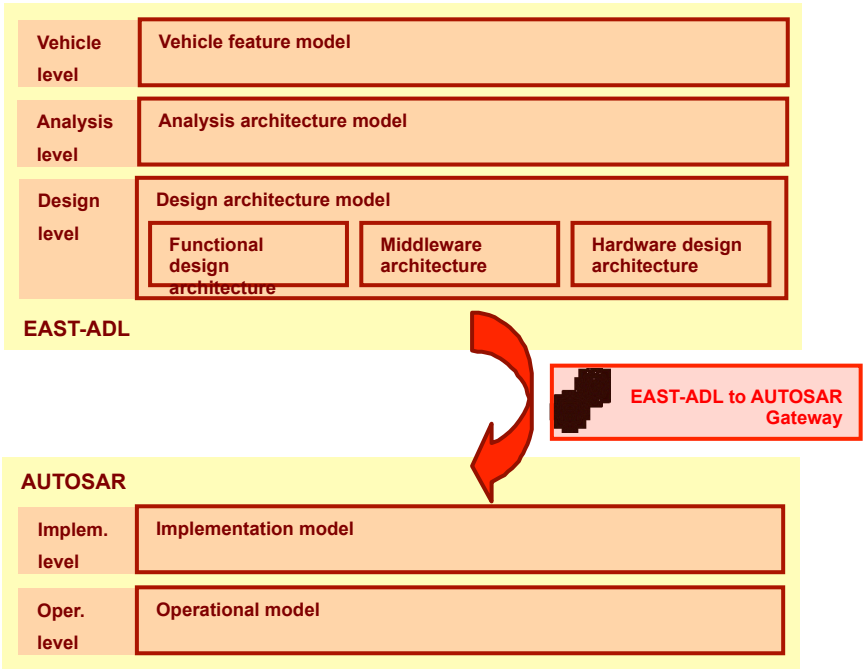


Safety analysis plugin



- **Enable safety analysis with HipHOPS engine**

Autosar gateway



- Updates from ATESST2 and EDONA (French System@tic cluster) results

  The refinement activity between EAST-ADL and AUTOSAR is:

  - Tedious and Repetitive
  - Error prone
  - Time consuming
  - Uneasy as it is necessary to manage AUTOSAR consistency and to make mapping (function / software) choice at the same time

- Automated mapping taking into account allocation constraints and hardware architecture.

Tool adaptations (preview)

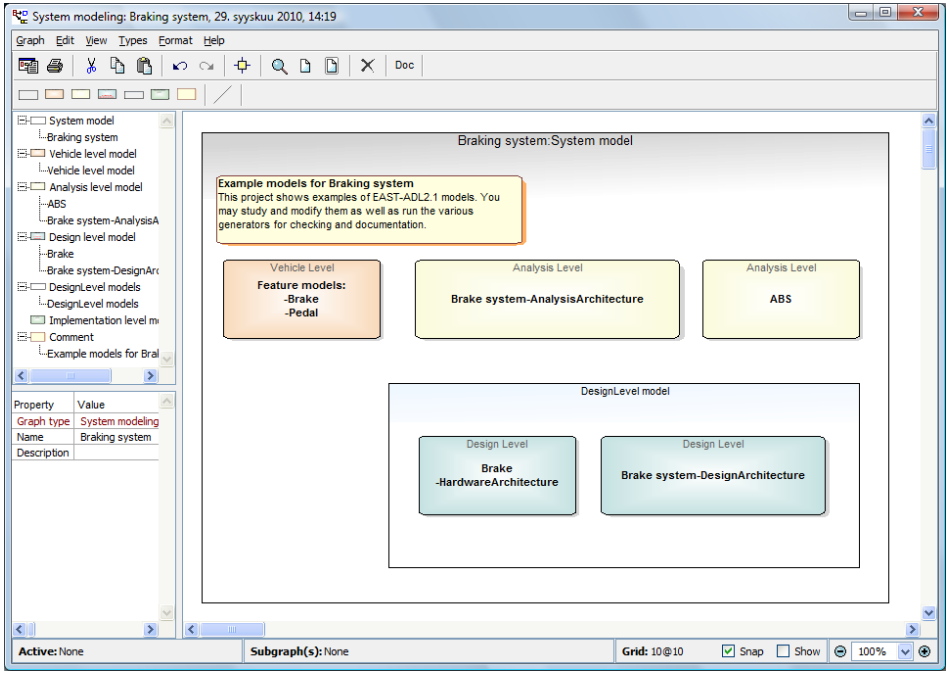
- Tool vendors commitment for EAST-ADL promotion
- Adaptations of existing commercial tools: MetaEdit+, SystemWeaver

- Interoperability based on EAXML format for EAST-ADL models
- Prototyping tool to
  - perform exchange between Modeling workbench and tool adaptations
  - Allow use of analysis workbench outside modeling workbench

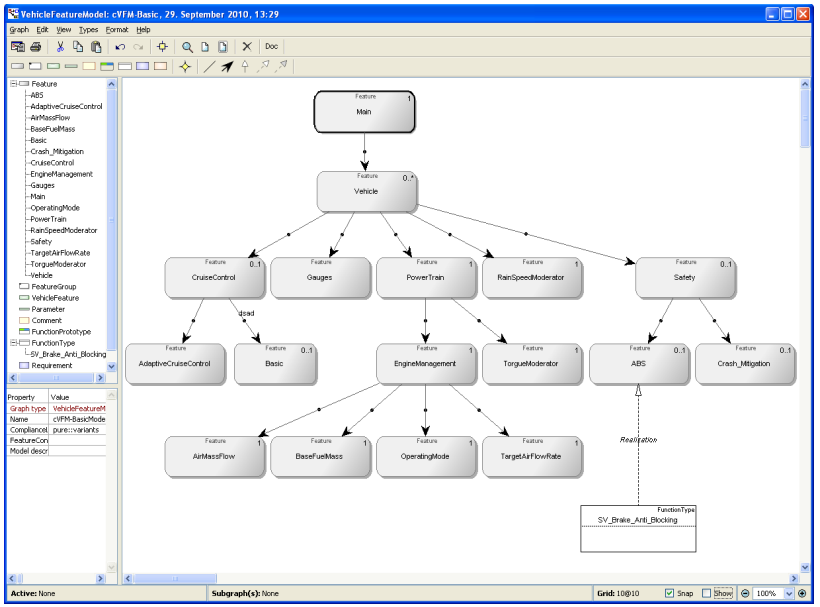
- Benefits are:
  - Verification of consistency between profile and metamodel
  - Broaden community use

✓ see dedicated concept presentations

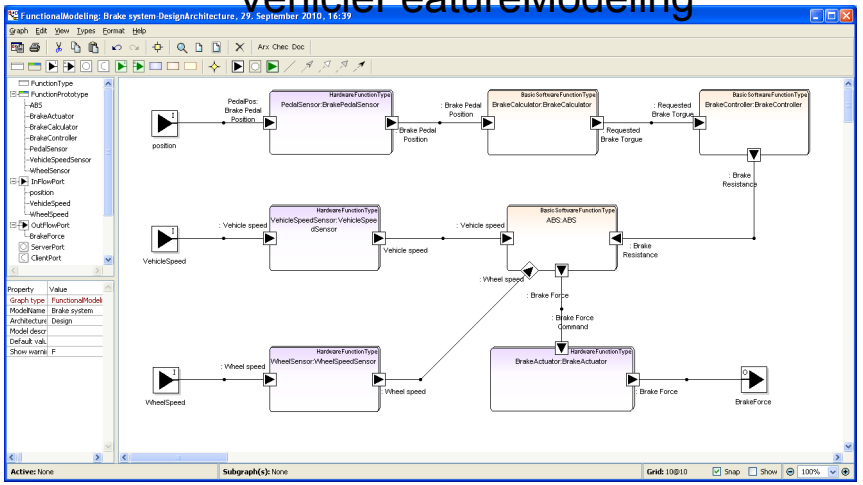
EAST-ADL with MetaEdit+



SystemModeling

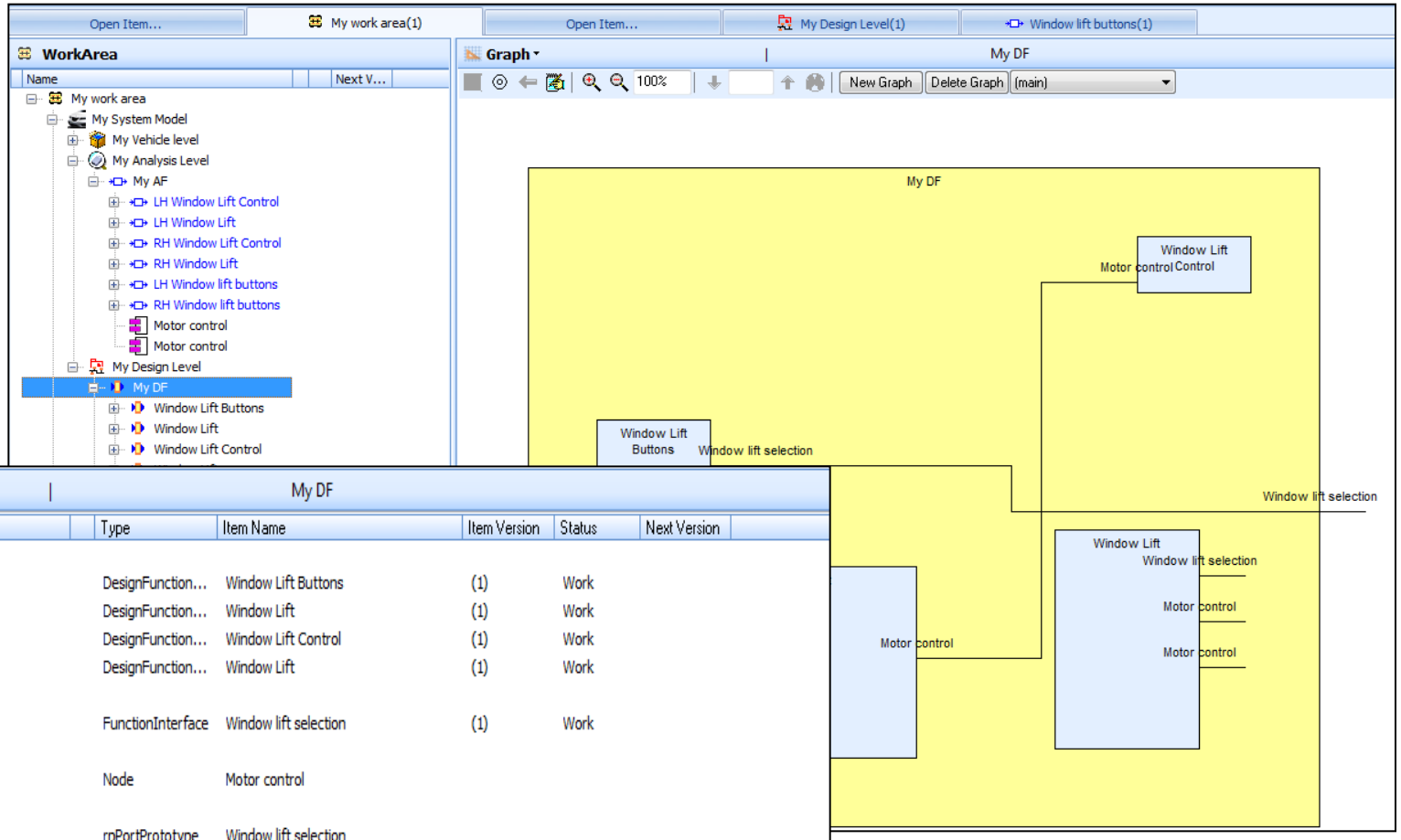


VehicleFeatureModeling



FunctionalDesignArchitecture

EAST-ADL with SystemWeaver



Parts | My DF

#	Part Name	Type	Item Name	Item Version	Status	Next Version
	designFunctionPrototype					
1	Window Lift Buttons	DesignFunction...	Window Lift Buttons	(1)	Work	
2	Window Lift	DesignFunction...	Window Lift	(1)	Work	
3	Window Lift Control	DesignFunction...	Window Lift Control	(1)	Work	
4	Window Lift	DesignFunction...	Window Lift	(1)	Work	
	rpPortPrototype					
1	Window lift selection	FunctionInterface	Window lift selection	(1)	Work	
	assembly FunctionConnector					
1	Motor control	Node	Motor control			
	delegation FunctionConnector					
1	Window lift selection	rpPortPrototype	Window lift selection			

Conclusion

- EAST-ADL supports automotive embedded systems modelling “starting” with needs and requirements and “ending” with an AUTOSAR SW architecture
- With maturity of language comes maturity of tools
- New priorities with MAENAD:
  - Interoperability: UML-profile, XML format
  - Analysis and design scenarios with various sets of tools
- ✓ See other concept presentations on Analysis workbench and tool adaptations