



Papyrus: Advent of an Open Source IME at Eclipse (Redux)

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A "Perfect Storm" for Tools

- Core technologies like MOF™ and UML® are evolving
 - Microsoft a member of Object Management Group™ (OMG™); revision of MOF (SMOF); UML RFP and roadmap working group
- Vendors have largely failed to provide consumable tools
 - time to question the status quo (some already are)
- Software industry is shifting
 - enterprises preferring **use** over **buy** over **build**
- **Opportunity to organize and provide industrial strength alternative to proprietary tools**



Overview

- Introduction
- Past - How Did Papyrus Get Here?
- Present - Where is Papyrus?
- Future - Where is Papyrus Going?
- Next Steps



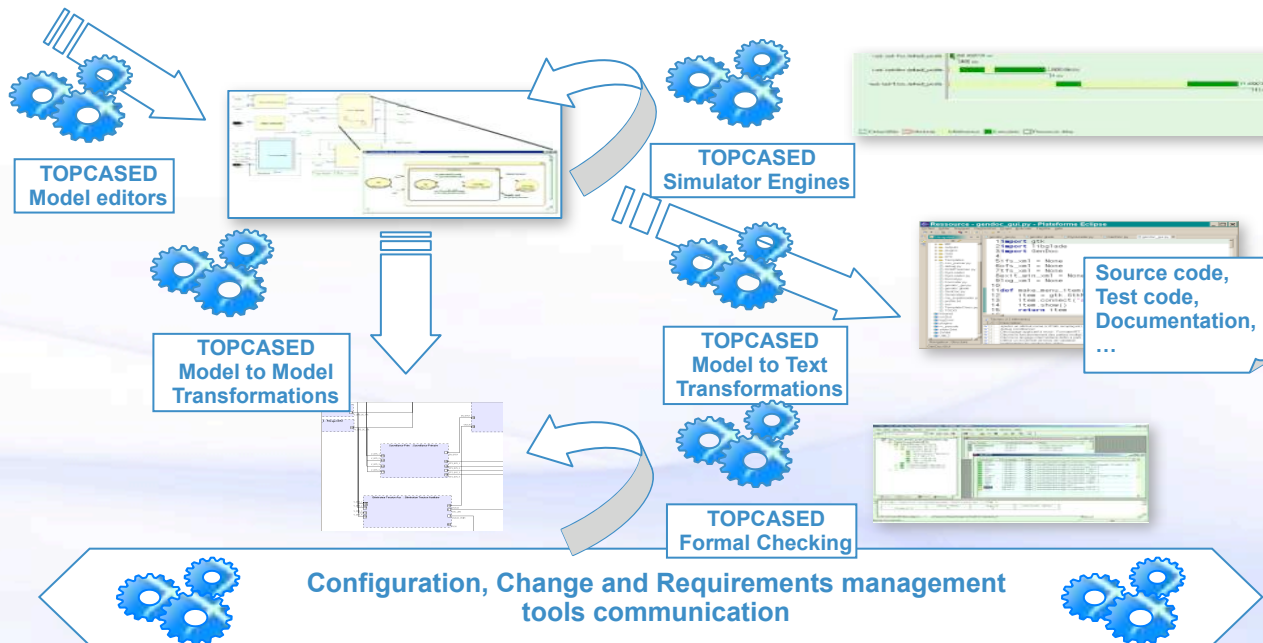
Papyrus I

- Based on Eclipse and the Eclipse UML2 project (now a subproject of MDT)
 - uses de facto reference implementation of *OMG's Unified Modeling Language™* (UML) metamodel at Eclipse
- Developed as an open source project, primarily by the LISE team of the Commissariat à l'Énergie Atomique (CEA) in France
 - to support development of real-time embedded systems
 - also led the definition of *OMG's MARTE* profile
- Strong focus on customizability
 - powerful profile definition capability
 - support for key UML diagram types (using DI2 standard)



TOPCASED

- TOPCASED is Model Based Engineering Platform initiated by a consortium of 30 industrial and research institutions including Airbus, Continental, Thales, Telecom Paris, and Rockwell Collins
- It targets safety-critical system design and is soundly based on Eclipse frameworks





MOSKitt

- Valencian Ministry of Infrastructure and Transport
- Offers support for generation and use of CASE tools
- Composed of different modules, including UML diagram editors, model explorer, transformation manager, reports generator, form editors, etc.
- Based on Eclipse UML2 format and reuses/extends UML2 Tools diagram editors
- UML2 and model explorer modules to be replaced with Papyrus



Papyrus at Eclipse

- Consolidation of several free open source UML tooling initiatives - Papyrus I, TOPCASED editor, and MOSKitt
- Integrated as an official subproject of Eclipse MDT
 - leverages infrastructure from Modeling project
 - shares strategic direction and release planning with other MDT subprojects
 - expands the field of contributors to Eclipse

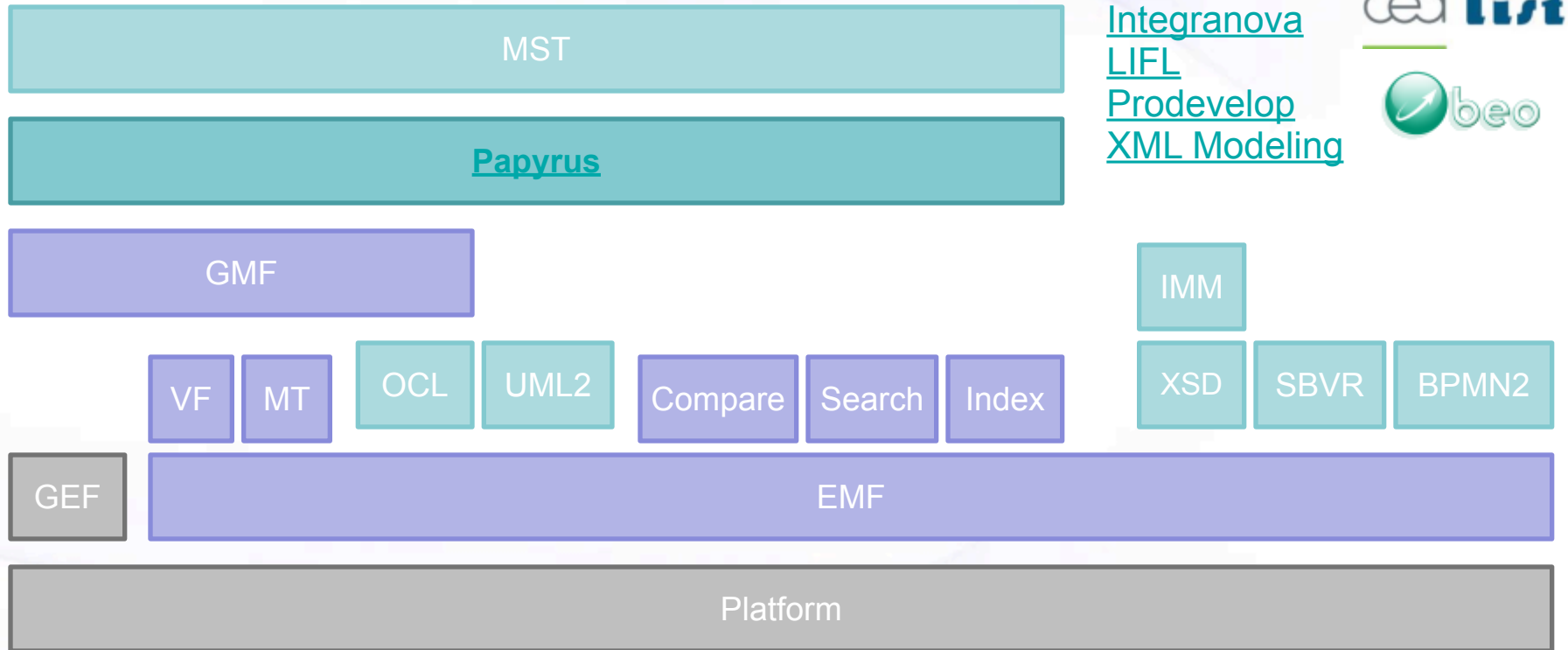


Model Development Tools (MDT)

- Model Development Tools is a Modeling sub-project at <http://www.eclipse.org/modeling/mdt>
- Inspired by the Eclipse community's demand for more end user "tooling" from the Modeling project
- Purpose of MDT is to provide extensible frameworks and exemplary tools for the metamodels within the scope of the Modeling project
- Next release scheduled for June 2010 (Helios)



Papyrus as a Subproject of MDT



[Atos Origin](#)
[Integranova](#)
[LIFL](#)
[Prodevelop](#)
[XML Modeling](#)



[Papyrus](#)



Other UML Efforts at Eclipse

- UMLX
 - prototype editors for a QVTd-based graphical transformation language
- UML2 Tools
 - UML diagram editors generated (almost entirely) with GMF
- Tigerstripe
 - custom "UML" implementation and domain-specific tools for telecommunications



Ensuring Project Success

- To be successful, an Eclipse project must provide both technology and business value
 - Technology
 - high-quality consumable frameworks and tools
 - Business
 - commercial benefit to developers, users, and vendors
- Diversity of contributors is also key to building a sustainable ecosystem
- Papyrus is among the most diverse projects at Eclipse and is poised to provide both kinds of value



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Milestones To Date — 0.7.0 M1

- Use case diagram (partial)
- Class diagram
- Preferences
- Model explorer
- Backbone
 - Multi-window manager
 - Multi-editor manager (tabs)
 - GMF editor adapter



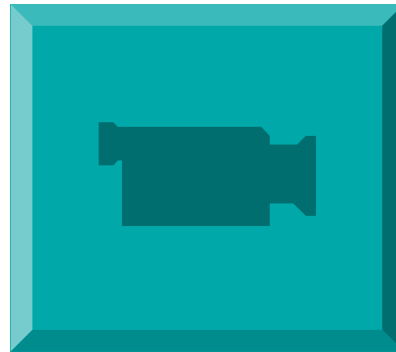
Milestones To Date — 0.7.0 M2

- Sequence diagram (partial)
- Composite diagram (partial)
- Control command to split models (prototype)
- Hyperlinks
- Model explorer refactoring (to remove UML dependencies)



Milestones To Date — 0.7.0 M3

- Use case diagram (complete)
- Block definition diagram
- Backbone support for DSLs



DEMO TIME!

diagrams, model explorer, model/diagram
synchronization, preferences



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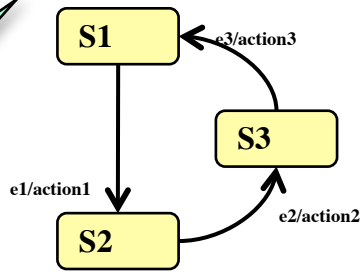


Model-Based Engineering (MBE)

- An approach to system and software development in which models play an indispensable role; based on two time-proven concepts

(1) ABSTRACTION

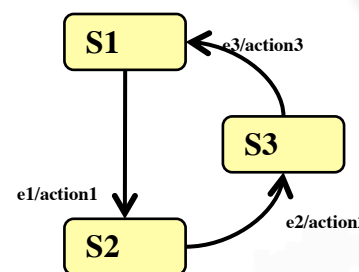
Realm of modeling languages



```
switch (state) {  
  case '1':action1;  
    newState ('2') ;  
    break ;  
  case '2':action2;  
    newState ('3') ;  
    break ;  
  case '3':action3;  
    newState ('1') ;  
    break ;  
}
```

(2) AUTOMATION

Realm of tools



```
switch (state) {  
  case '1':action1;  
    newState ('2') ;  
    break ;  
  case '2':action2;  
    newState ('3') ;  
    break ;  
  case '3':action3;  
    newState ('1') ;  
    break ;  
}
```



Integrated Modeling Environment

- Industry demand for open source MBE tools is growing
 - prompted creation of Eclipse Modeling project and its subproject, **Model Development Tools (MDT)**
- Papyrus is intended to respond to that demand by providing an industrial quality, integrated toolset (**IME**) that supports MBE
 - key principles driving Papyrus development include **customizability, extensibility, scalability, usability, interoperability, and interactivity**



Customizability

- It should be possible to use Papyrus and its existing facilities in ways that are best suited to the task at hand
 - provide extensive preferences for user defined settings
 - support form-based editing via highly customizable Properties view
- Bugs 249777, 257049, 269660, 271057, 290237, 290257



Extensibility

- It should be possible to extend Papyrus with new capabilities (tools, processes, languages, methods), including those that may not have been anticipated during inception
 - provide extension points for key points of variability
 - support tool specialization via *OMG SysML™*, *MARTE*, and other profiles
 - facilitate the development of domain specific languages (DSLs)
- Bugs 269490, 269492, 269494, 277478



Scalability

- Papyrus should be able to efficiently cover a broad range of differently sized problems, scaling not only in the complexity of the system being developed, but also in the size of development teams and environments involved
 - leverage EMF CDO for more scalable Ecore, UML, notation models
 - use RESTful resources API from e4 to support arbitrary repositories
 - support binary EMF resource implementations
- Bugs 275666, 290937, 290939, 290941



Usability

- Papyrus should minimize the cognitive load on users; this should extend beyond good UI design to include aspects such as adapting to specific models and (individualized) modes of usage
 - provide comprehensive documentation for both users and developers
 - introduce custom widgets (e.g., ribbons and Chrome-like navigation bar)
 - apply UI styling from e4
 - leverage Eclipse UDC and/or heuristics to personalize UI
 - integrate with Mylyn to support task-focused modeling
- Bugs 273415, 273416, 273417, 273418, 273419, 282857, 288362, 290246, 290943, 290944, 290945, 290946



Interactivity

- Papyrus should provide users with the ability to interact and share artifacts in real time, as well as monitor each others' progress via social media facilities
 - expose resource partitioning functionality provided by EMF
 - leverage EMF Compare for concurrent modeling
 - support CDO model repository as a backing store for models
 - utilize Google Wave protocol to facilitate real-time communication
- Bugs 275628, 277680, 290951, 290952, 290953

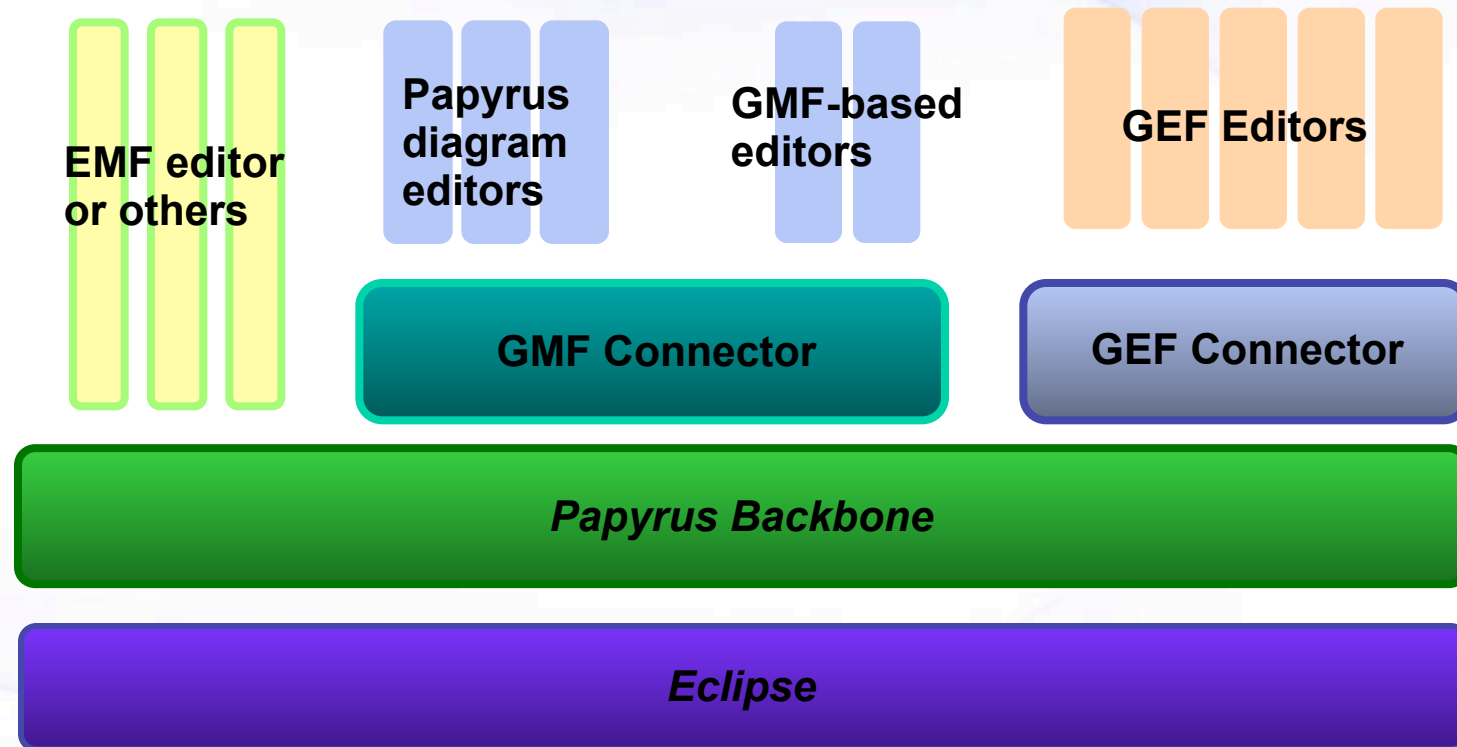


Interoperability

- Wherever possible, Papyrus should favor industry standards over custom solutions so as to facilitate interworking with external toolsets
 - provide full support for important UML and OMG SysML diagram types
 - maintain compliance with latest standards, i.e., OCL, UML, OMG SysML
 - participate in the model interchange working group at the OMG
- Bugs 281320, 290725, 290948, 290949, 290954



Papyrus Architecture





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Helios Development Plan (1/3)

Version	1.0			
Date	21/09/2009			
Milestone 1	Milestone 2	Milestone 3	Milestone 4	
11-sept	16-oct	13-nov	11-déc	
Milestone 5	Milestone 6	Milestone 7		
30-janv				
#ID	add diagram, control, open diagram, delete,	Scope	Details	Milestone
1	I can create sub models	Collaborative work	requires delete UML and DI dependencies from the backbone	Milestone 4
2	I can create a sequence diagram with main (common) features	Sequence	lifelines, combinedFragments, messages (partial), guard, interaction	Milestone 2
3	I can create a sequence diagram with advanced features	Sequence	part decomposition, gates...	Milestone 4
4	I can create a composite structure diagram with main features	Composite	Rolebinding / Deletion Feedback	Milestone 4
5	I can create a state machine diagram and make the main features	State Machine	Pseudo state, region, transition	Milestone 4
6	I can create an activity diagram with main features	Activity		Milestone 5
7	I can create and edit a timing diagram	Timing diagram		Milestone 6
8	I can manage (customize) model properties in a dedicated view	EEF properties	for advanced users (administrators)	Milestone 5



Helios Development Plan (2/3)

Version	1.0			
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Milestone 5	Milestone 6	Milestone 7		
30-janv				
#ID	add diagram, control, open diagram, delete,	Scope	Details	Milestone
9	I can create a profile using the diagram editor	Profile		Milestone 4
10	I can navigate in a model tree view and interact with it	Model explorer / Outline	add diagram, control, delete, filter,	Milestone 4
11	I can create and manage SysML models	SysML	activate SysML diagrams and SysML profile	Milestone2
12	I can create and edit properly all the features of a Class diagram	Class	fix critical or blocking bugs	Milestone 4
13	I can create and edit properly all the features of a Use Case diagram	Use case	fix critical or blocking bugs	Milestone 3
14	I can manage a Papyrus model with a single resource	model + diagrams	Encapsulation of DI, notation and EMF	Milestone 4
15	I can install Papyrus feature in an Eclipse Platform	continuous Integration	P2, update site	Milestone 2
16	I can create a DSL based on papyrus backbone	backbone	advanced user : requires delete UML and DI dependencies from the backbone	Milestone 3

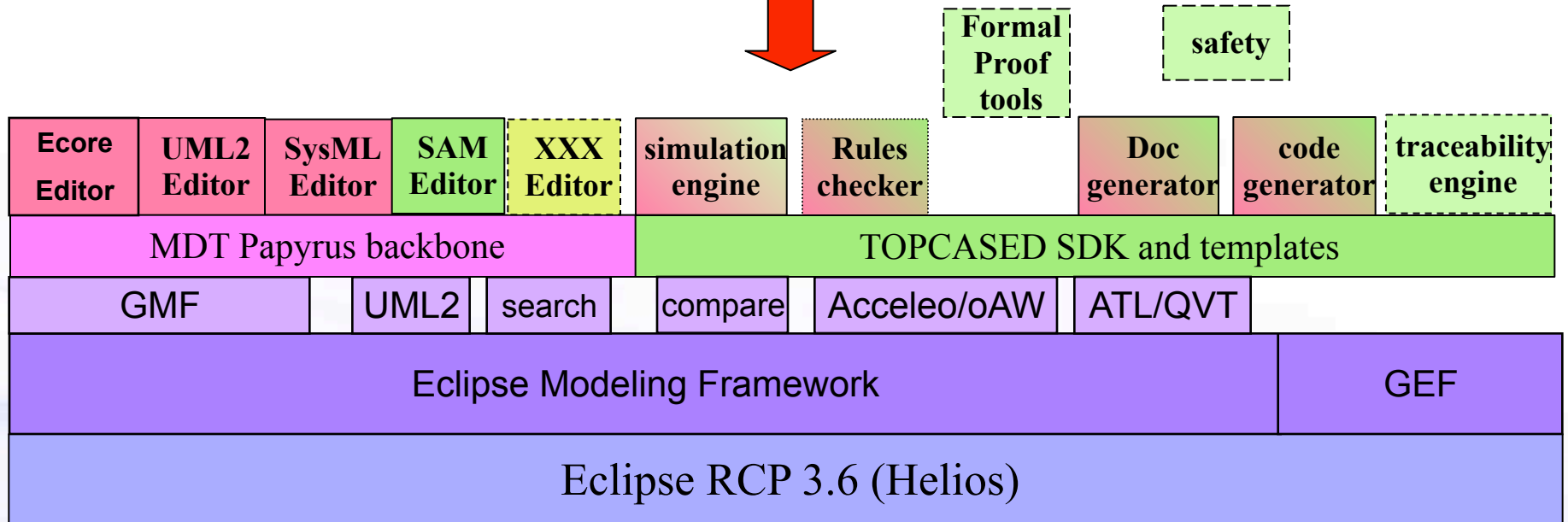
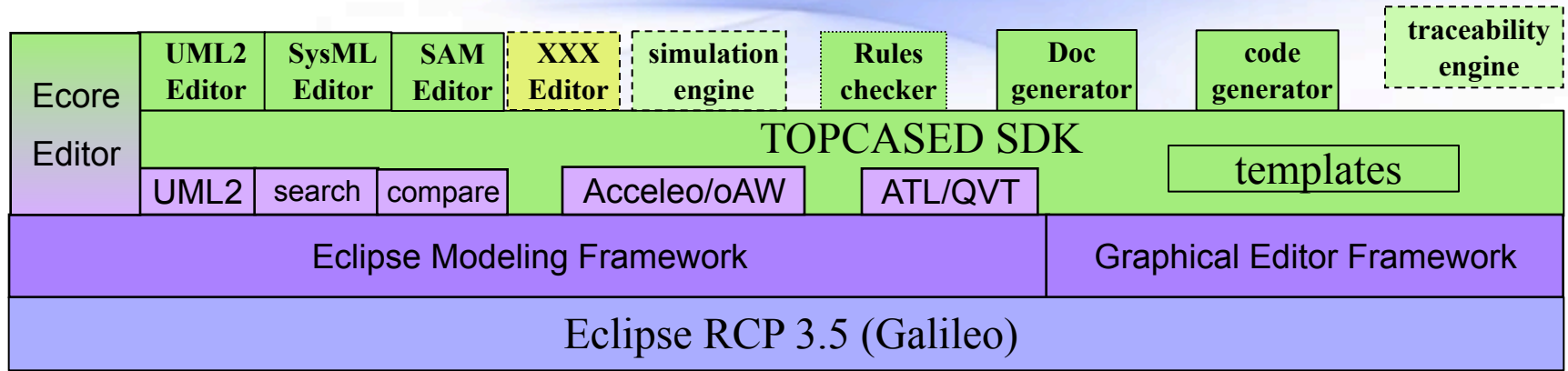


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Milestone 5	Milestone 6	Milestone 7		
30-janv				
#ID	add diagram, control, open diagram, delete,	Scope	Details	Milestone
19	I can create and edit Block Definition Diagram	BDD		Milestone 3
20	I can create and edit Internal Block Diagram	IBD		Milestone 4
21	I can create and edit a parametric diagram	PARA		Milestone 5
22	I can create and edit a requirement diagram	REQ		Milestone 6
23	I can edit my comment through a rich text editor	Specific view	from TOPCASED	Milestone 5
24	I can create a Deployment Diagram	Deployment		
25	I can create an Overview diagram	Overview		
26	Performance measures and optimization	All diagrams on different models with different sizes	load, edit, delete	Milestone 6
27	usability			



After Helios...





This Just In

- Sessions well-attended at Eclipse Summit Europe; further evidence of “perfect storm”
 - “Integrated Modeling Toolset” BoF
 - Papyrus long talk
- New initiatives underway
 - Sphinx project proposal
 - Consumer interest groups
- Papyrus will be aligned with these (and other) initiatives to drive additional technology and business value



How Can You Help?

- As a developer...
 - write documentation
 - participate in mailing list discussions
 - become a Papyrus contributor!
- As a vendor...
 - build extensions for Papyrus
 - participate in **industry working groups**
- As a user...
 - use Papyrus
 - participate in forum discussions
 - report bugs



More Information

- For developers...
 - http://wiki.eclipse.org/Papyrus_Developer_Guide
 - <http://dev.eclipse.org/mailman/listinfo/mdt-papyrus.dev>
- For vendors...
 - <http://www.eclipse.org/papyrus>
- For users...
 - <news://news.eclipse.org/eclipse.papyrus>



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- MOF, Object Management Group, OMG, OMG SysML, and Unified Modeling Language are trademarks of the Object Management Group
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