

Comparing and Merging Models with Eclipse

An update on EMF Compare ...

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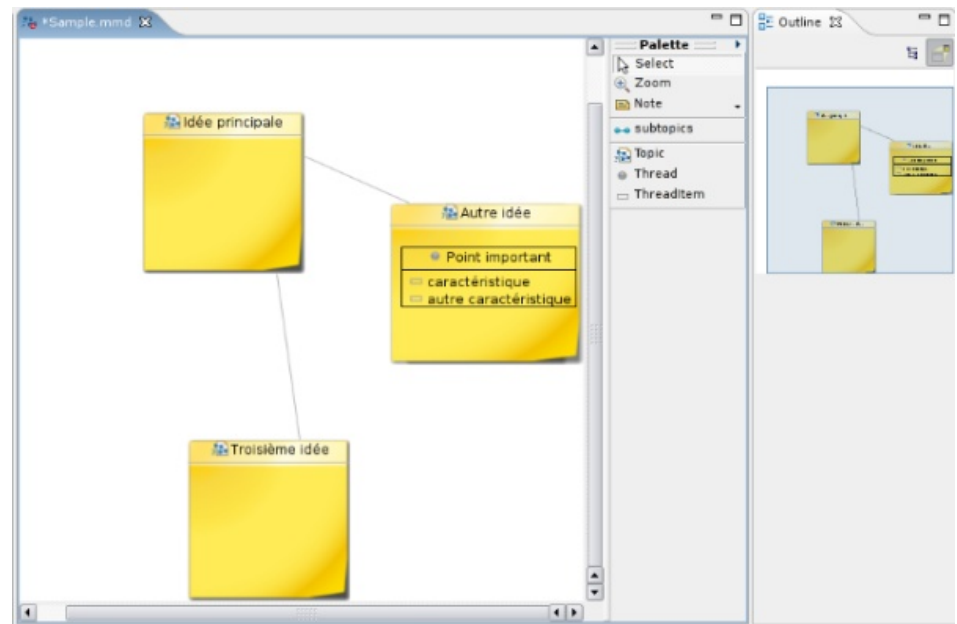


Working with models in Eclipse ?



EMF / GMF : modeling support


- Modeling, Meta-modeling
- Editors and modelers




```
platform:/resource/fr.obeo.dsl.mindmap/mo
└─ mindmap
   └─ DocumentRoot
      └─ map : Map
         └─ Map
            └─ title : EString
            └─ author : EString
            └─ ownedTopics : Topic
            └─ ownedRelationships : Relationship
            └─ Topic
            └─ Thread
            └─ Threaditem
            └─ Relationship
```

M2T / Acceleo : generate text from models

▼  platform:/resource/free.demo.mindmap/model/ESE2007.mindmap


▼  Map Eclipse Summit Europe 2007

 Topic Working with models in Eclipse


▼  Topic EMF/GMF : modeling support


● Thread Modeling, Meta-modeling


● Thread Editors and modelers


 Topic M2T/Acceleo : generate text from model


 Topic M2M : transform models in models


 Topic Have a try ?


 Topic No team-work support

 Topic Back in 2006

 Topic Eclipse Summit Europe 2006

▶  Topic Result ?

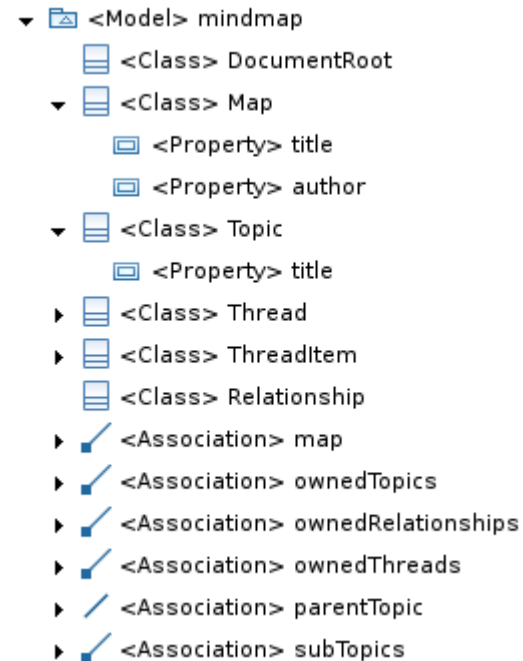
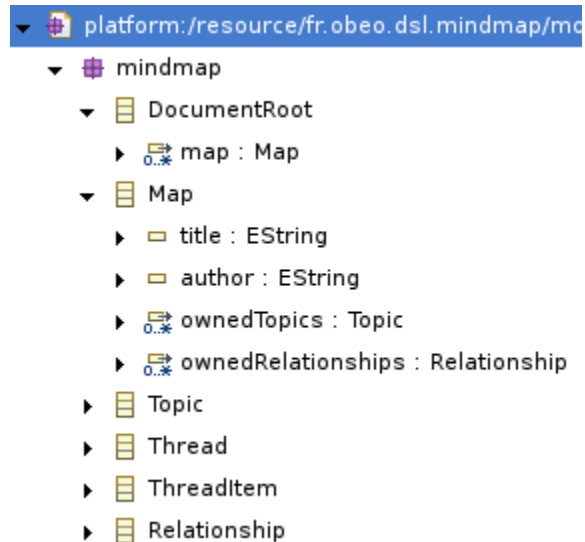
▶  Topic History

▶  Topic Why should you bother ?

```
<%script type="Topic" name="content"%>
  <div id="content">
    <%for (ownedThreads){%>
      <div class="item">
        <b><%title%></b>
        <%for (ownedItems){%>
          <p>
            <%content%>
          </p>
        <%}%>
      </div>
    <%}%>
    <!--now handling subtopics-->
    <%subTopics.target.itemTopic%>
  </div>

<%script type="Topic" name="itemTopic"%>
  <div class="item">
    <h2><%title%></h2>
    <%for (ownedThreads){%>
      <p>
        <%title%>
      </p>
    <%}%>
  </div>
```

M2M : transform models to models

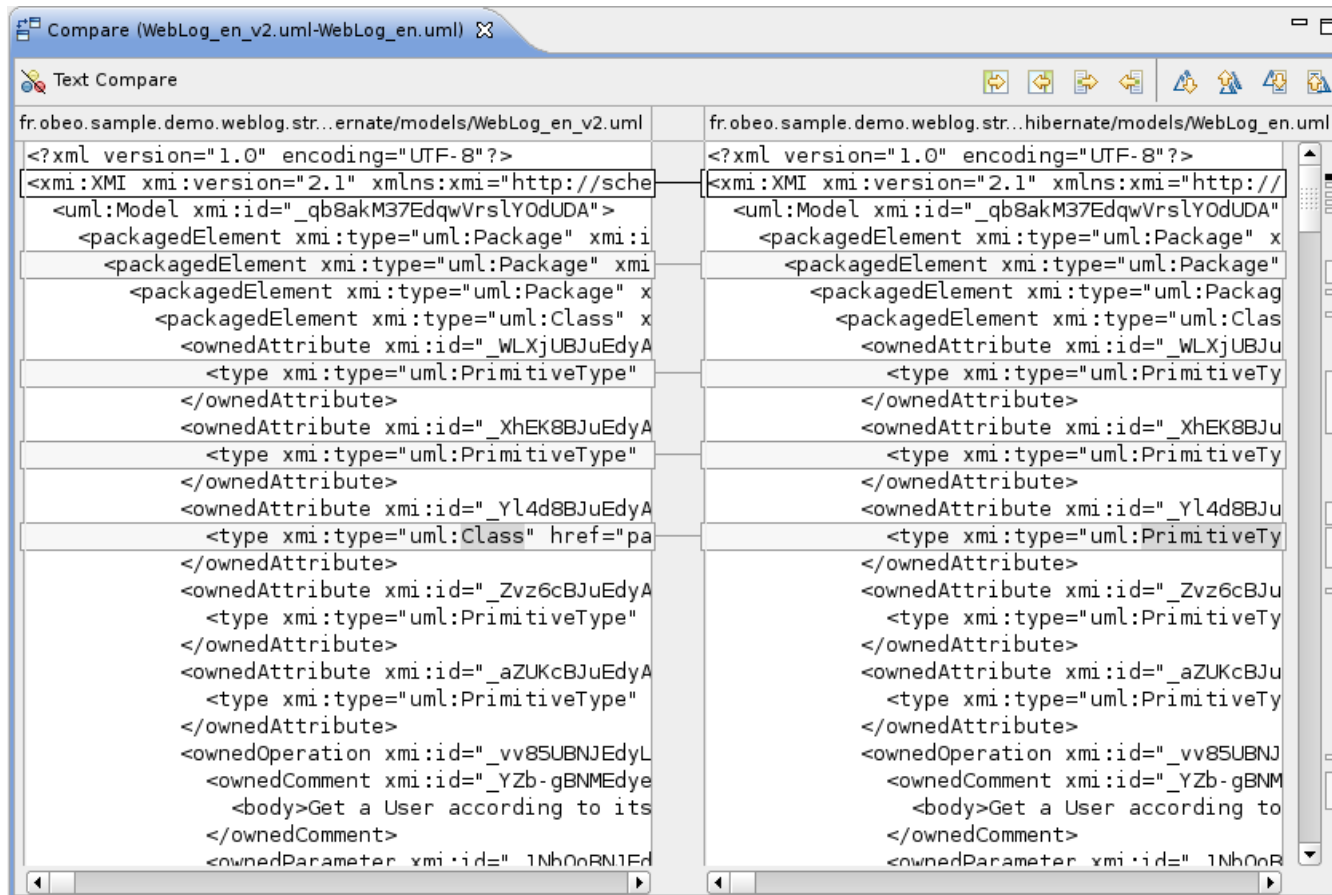


- UML Tools, Query/Transaction/Validation, ...

Have a try ?



No team-work support



Back in 2006...



Eclipse Summit Europe 2006

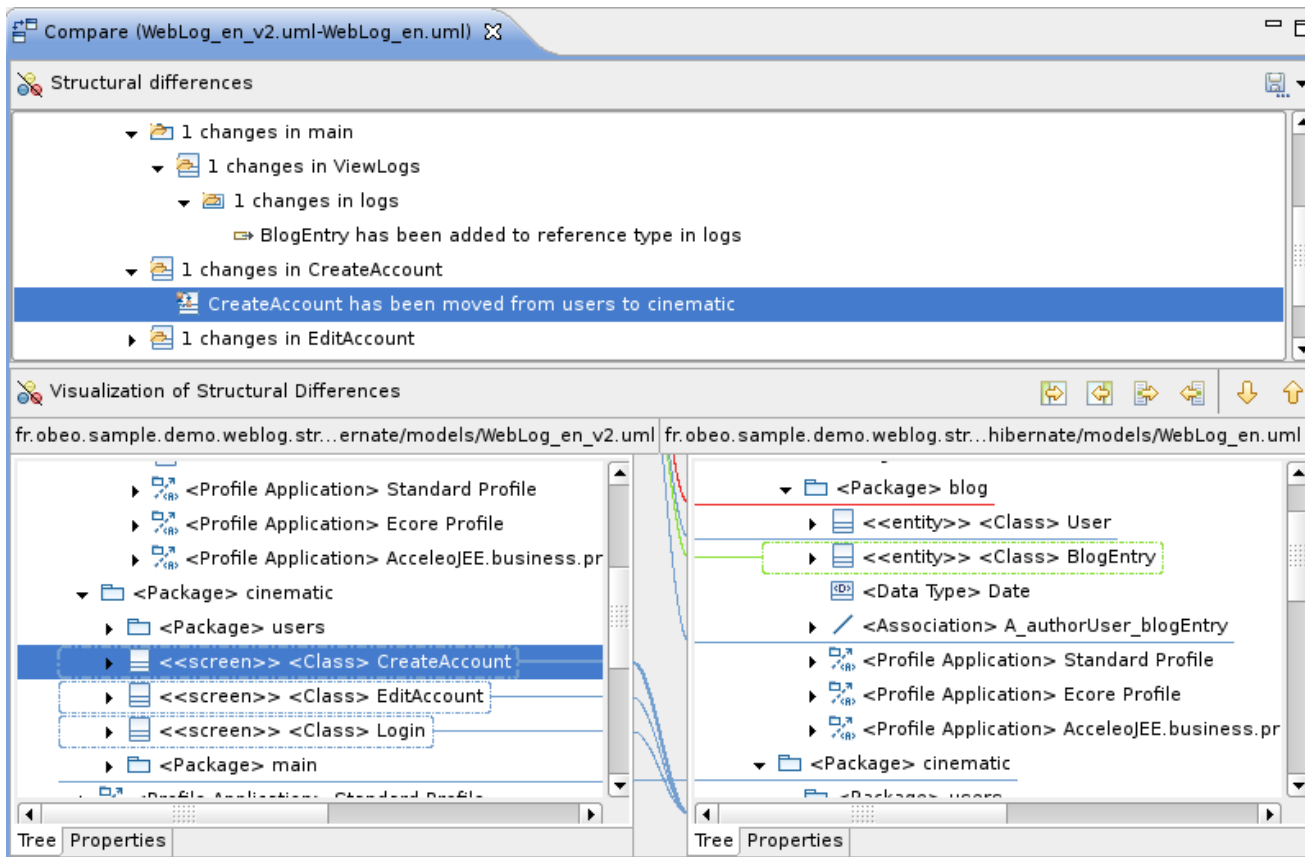
- Modeling symposium lighten the fact that this component is essential and missing.
- Obeo and Intalio contribute their own initial implementations



EMF Compare



Result ?



- differencing
- merging
- team API integration
- diff export
- extensibility

History

- October 2006 : Eclipse Summit Europe
- November 2006 : EMF Compare Proposal
- March 2007 : IP approval
- June 2007 : First builds on Eclipse.org
- September 2007 : Stable builds for 0.7.0
- January 2008 : 0.8.0 is « feature complete »

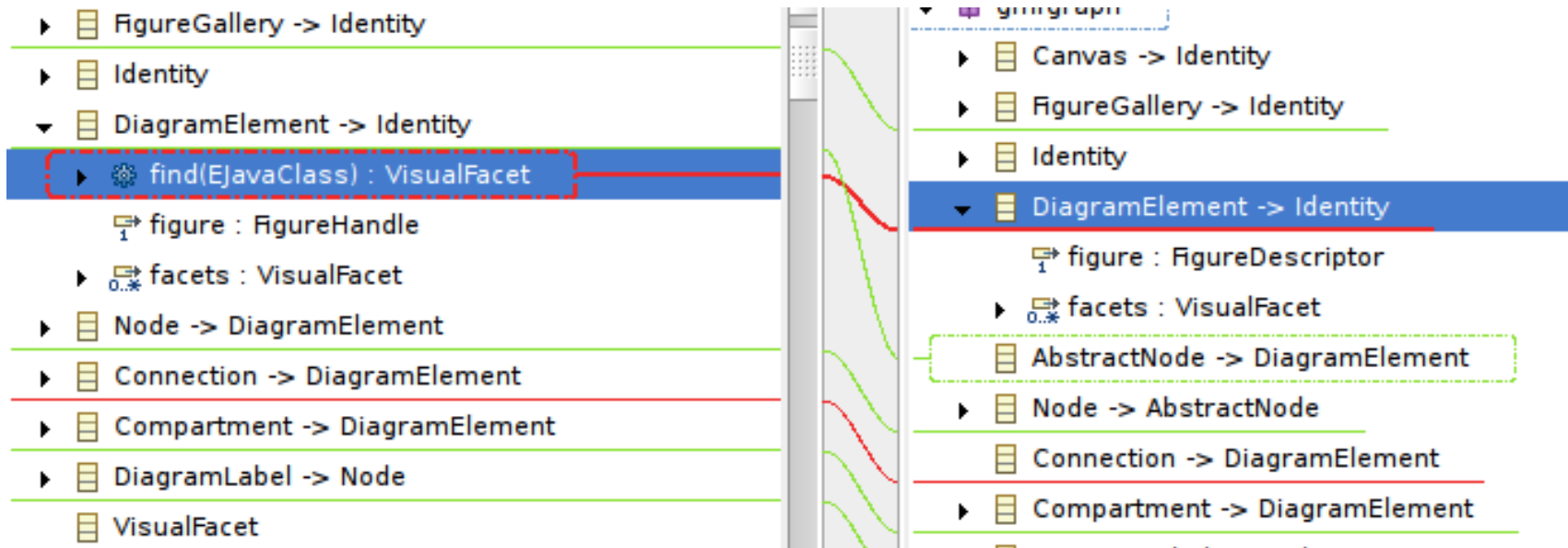


Why should you bother ?



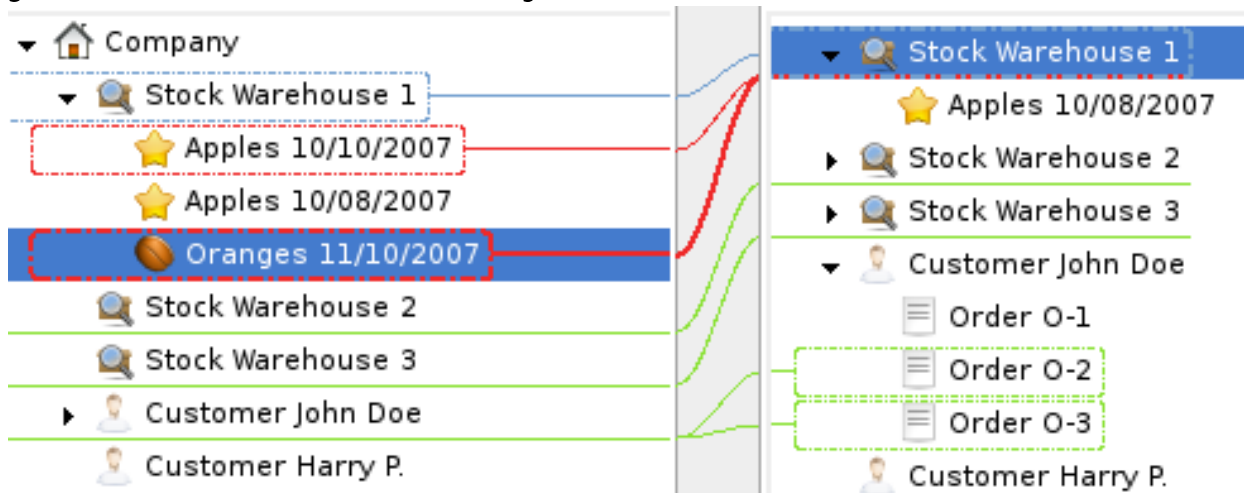
As an Eclipse user

- develop using models !



As an RCP developer

- compare your own business objects



- do not depend on Eclipse IDE
- « in memory » comparison
- produce history reports

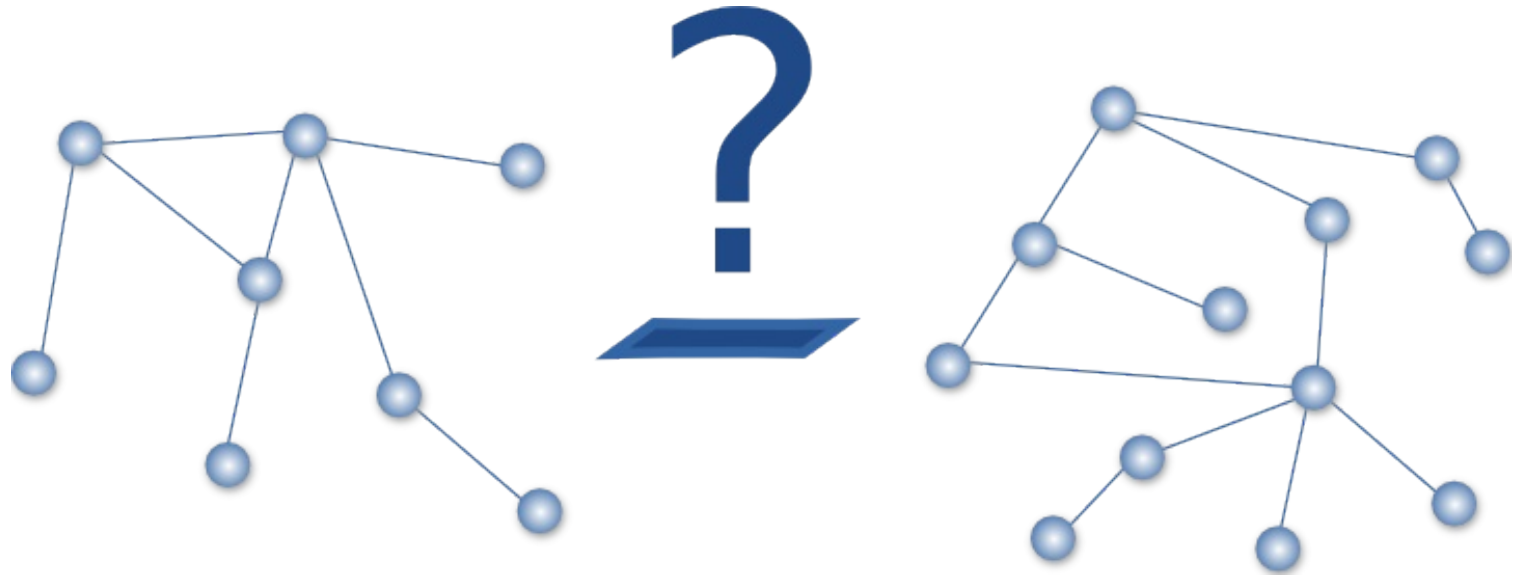
As an « development tools » developer

- incremental processing
- « mymodel » support
- XML based file comparison

```
<extension
  point="org.eclipse.core.contenttype.contentTypes">
  <content-type
    id="org.eclipse.emf.compare.ui.contenttype.ModelContentType"
    name="Model File"
    priority="normal"
    file-extensions="mymodel">
  </content-type>
</extension>
```

As a researcher

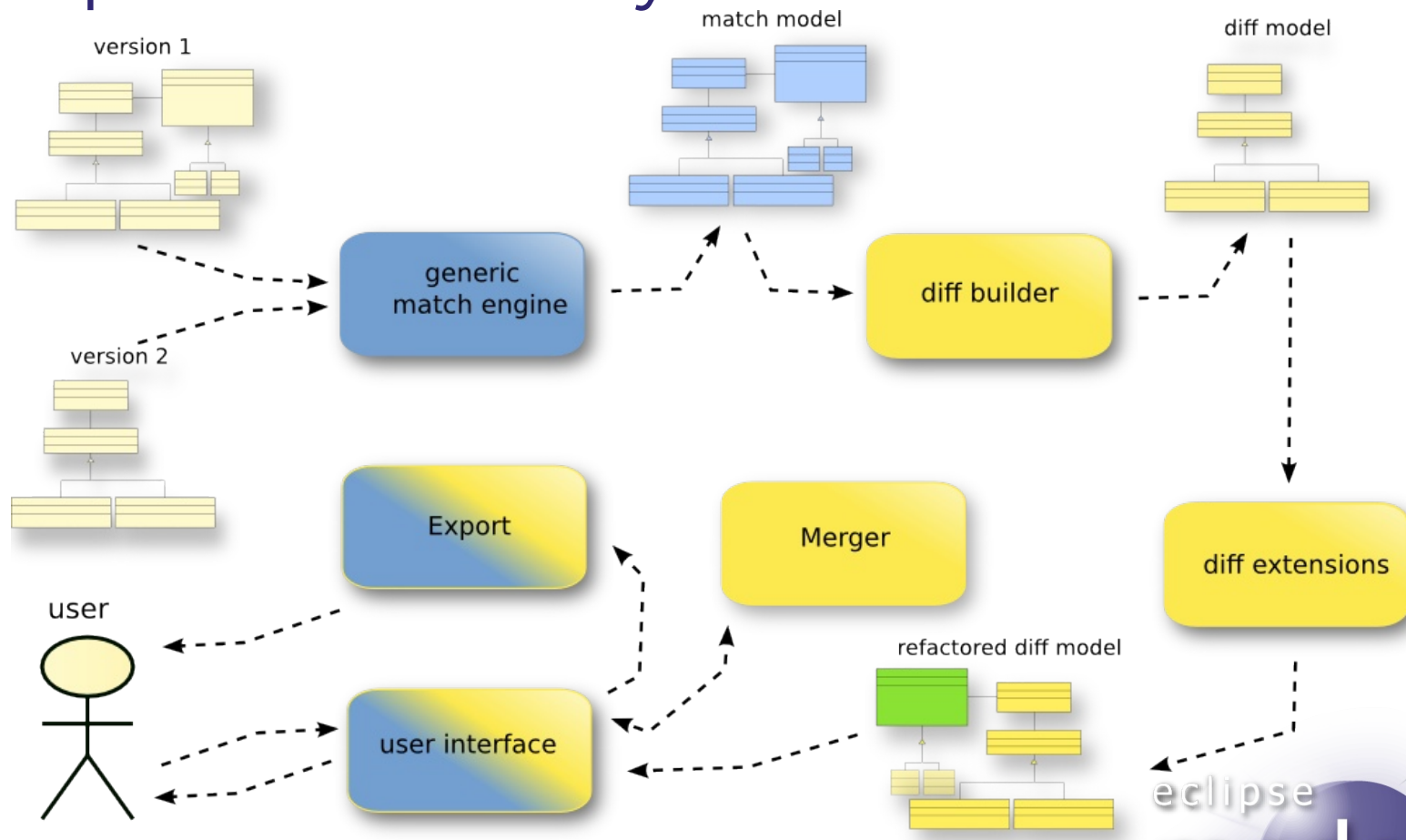
- testbed for models/graphs comparison algorithms



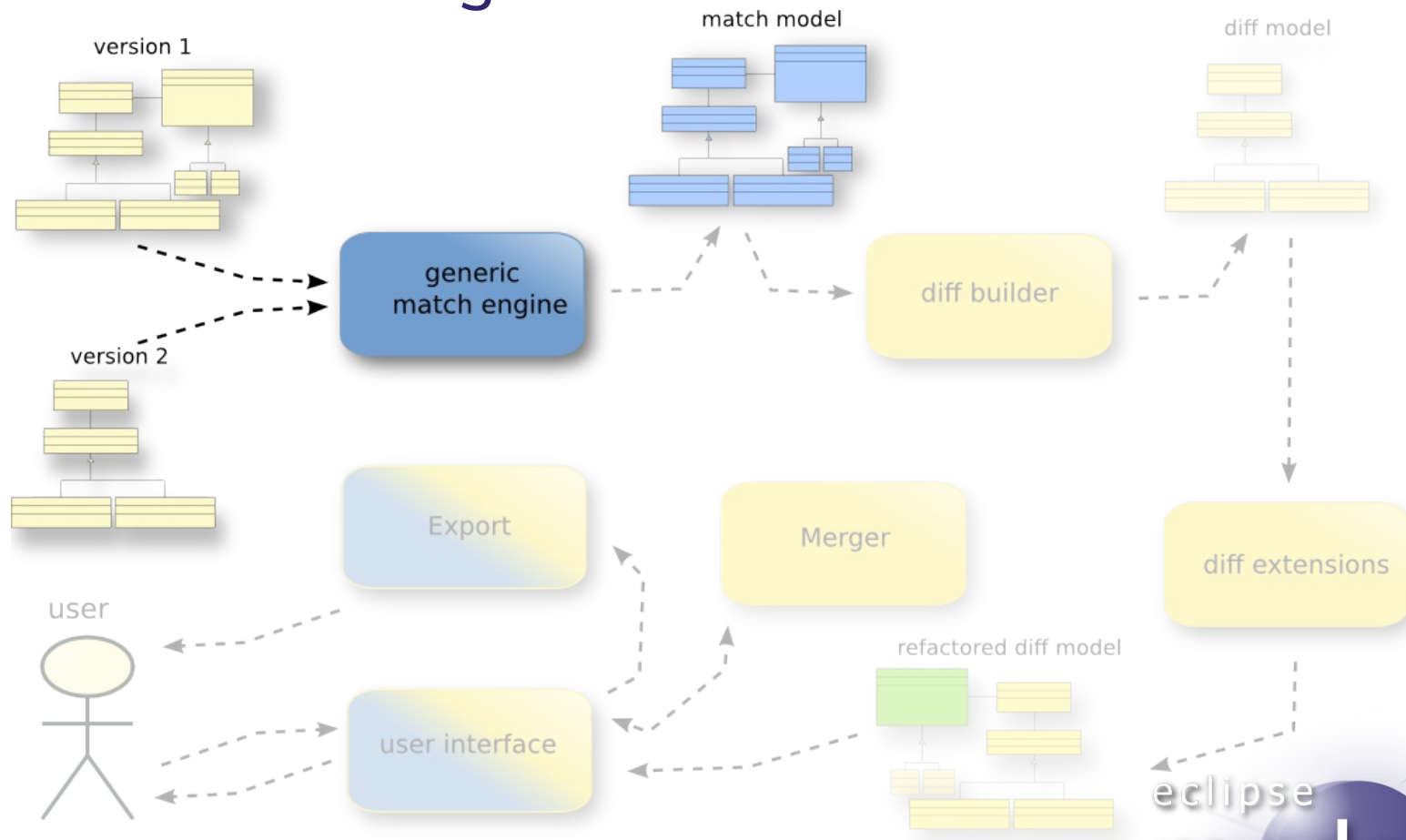
How does it work ?



Principles : models everywhere



Phase 1 : matching elements



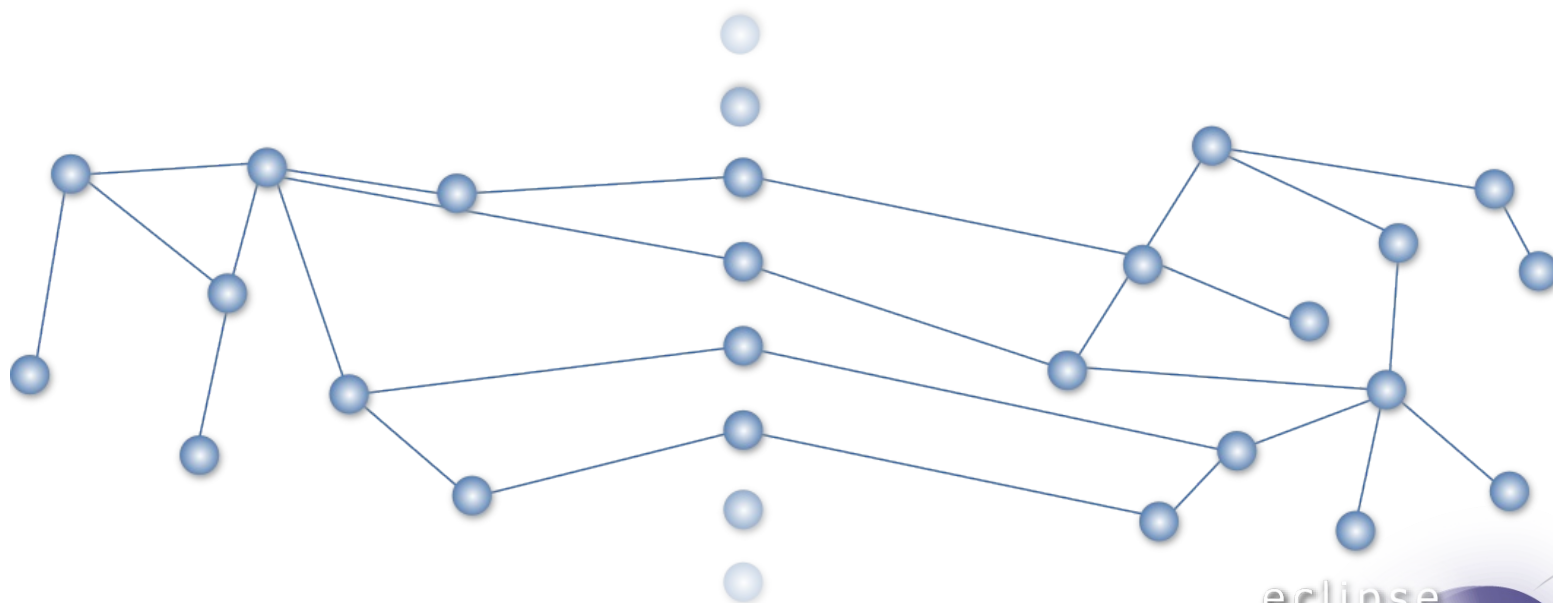
Match engine

- are « a » & « b » similars ?
- produce a match model

version 1

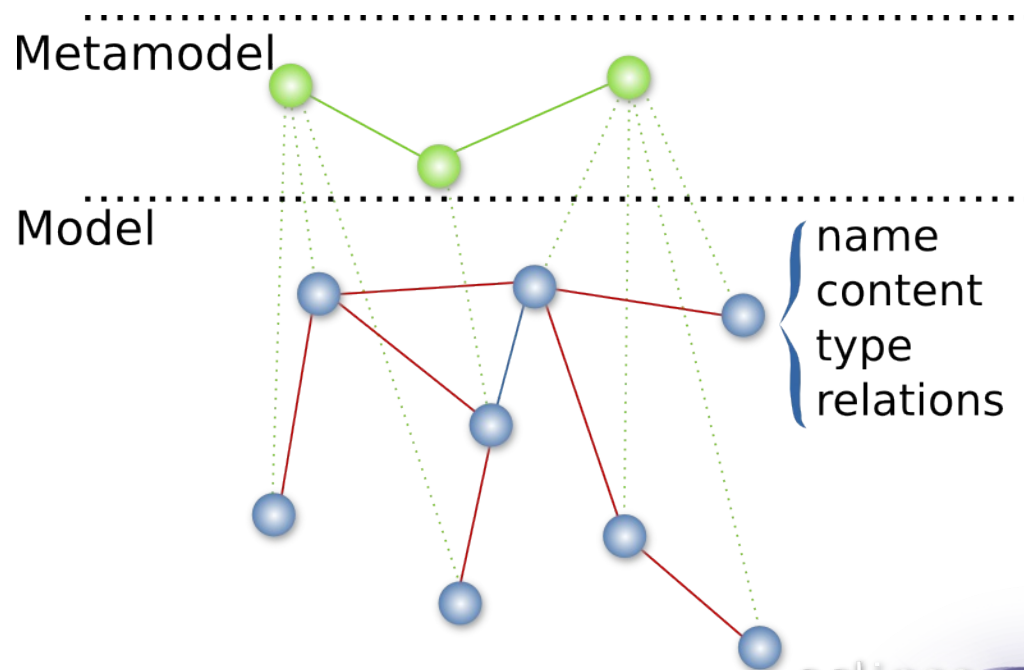
match model

version 2

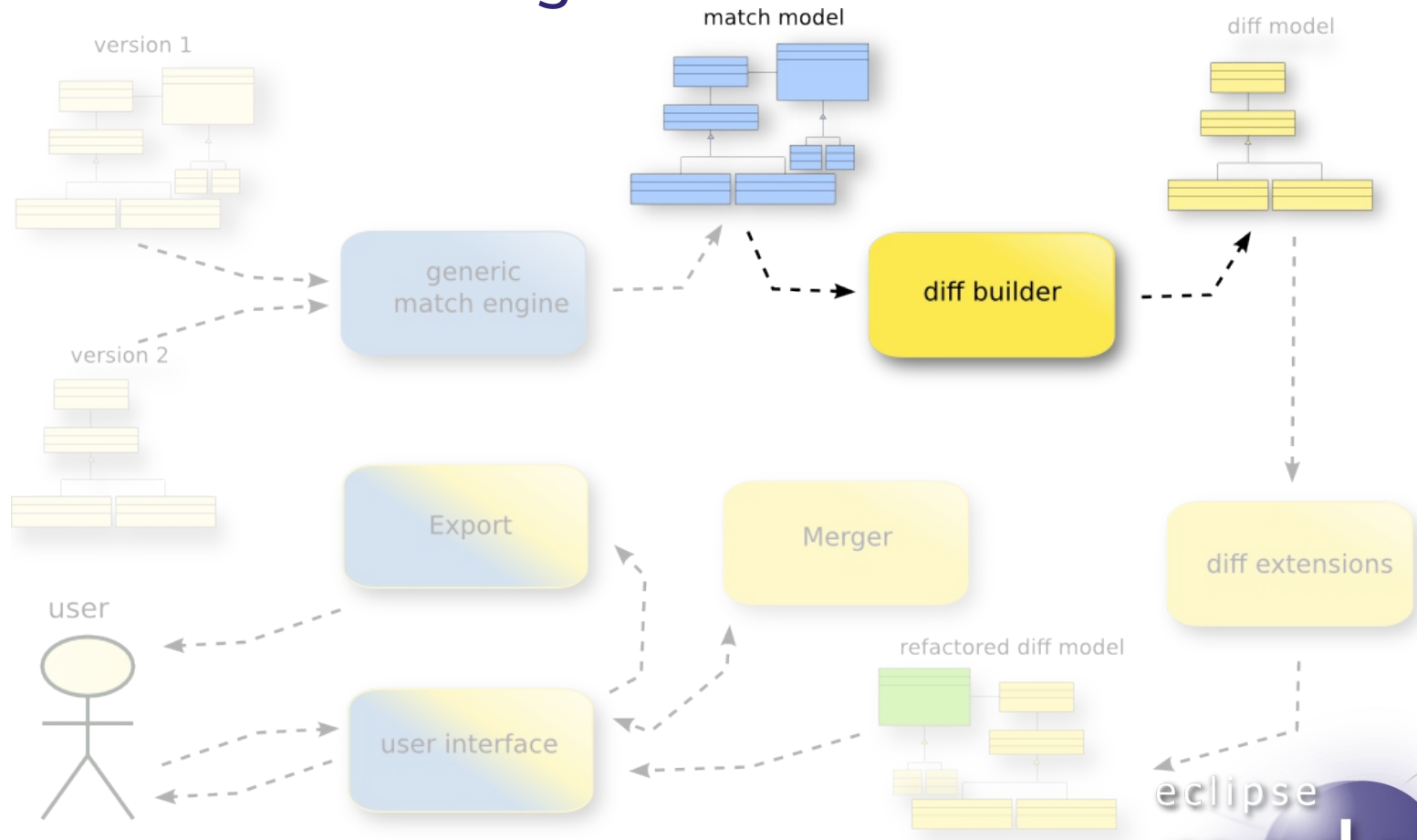


Generic matching engine

- heuristic based
- metamodel agnostic
- 4 metrics
 - name
 - content
 - type
 - relations



Phase 2 : differencing

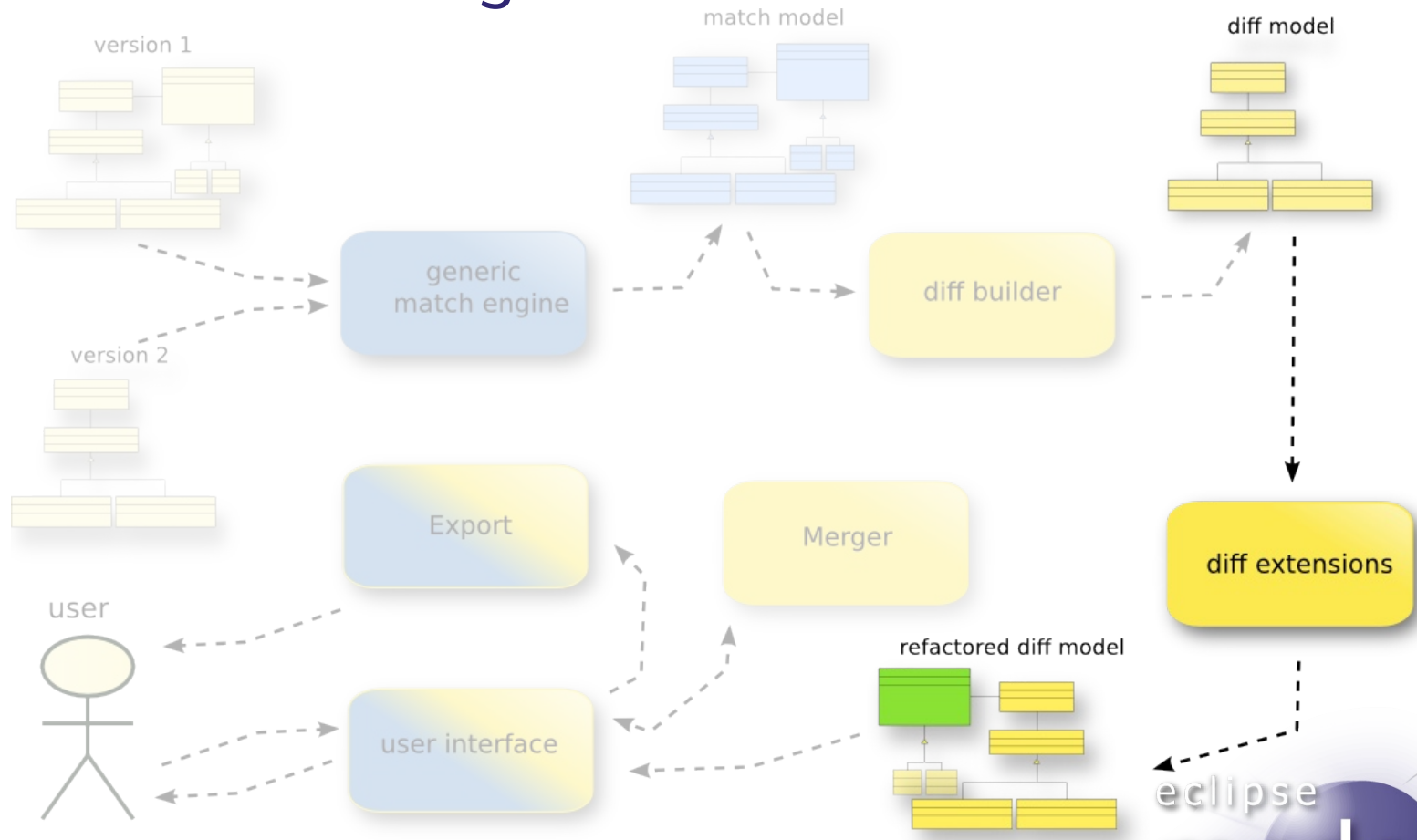


Differencing engine

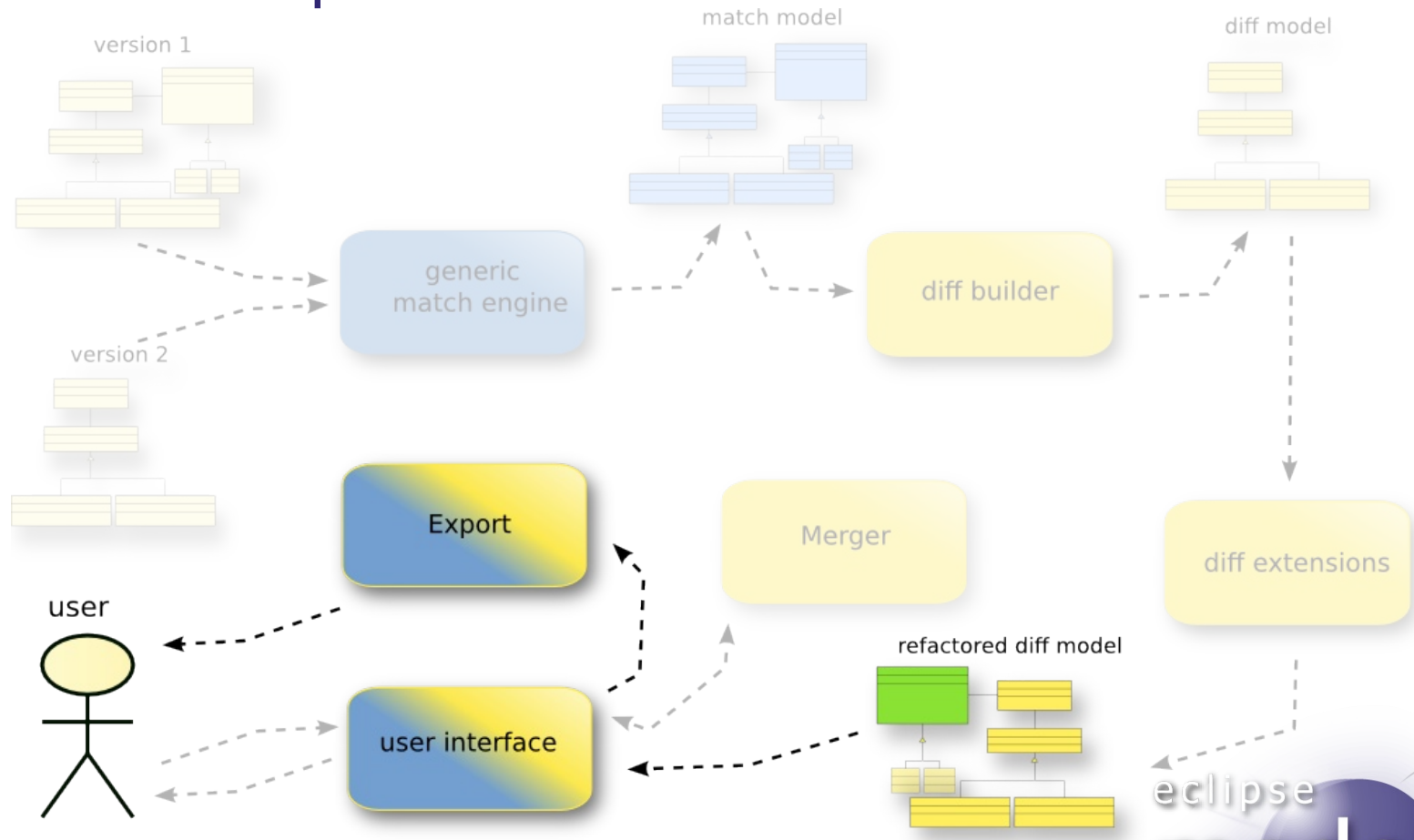
- produces the diff model from the match model

- ▼ 70 changes in model
 - ▼ 70 changes in gmfgen
 - ▼ 3 changes in LinkLabelAlignment
 - ▶ 1 changes in MIDDLE
 - ▶ 1 changes in TARGET
 - ▶ 1 changes in SOURCE
 - ▼ 3 changes in TypeModelFacet
 - ▼ 3 changes in modelElementInitializer
 - ✖ GenElementInitializer has been removed from reference eType in modelElementInitializer
 - ✖ typeModelFacet has been removed from reference eOpposite in modelElementInitializer
 - ⚙ EGenericType has been removed
 - ▶ 4 changes in ViewmapLayoutType
 - ▼ 2 changes in Palette
 - ▶ 2 changes in groups

Phase 3 : extending the diff model

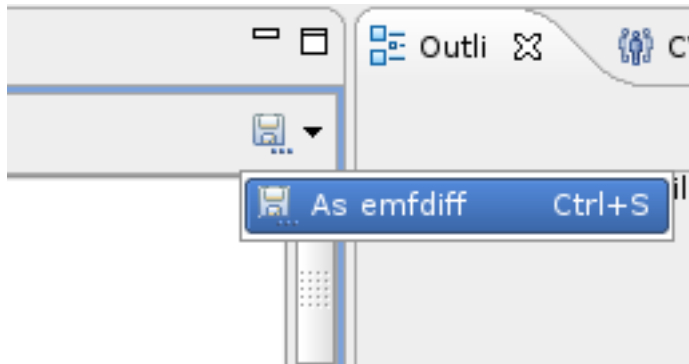


Diff model export



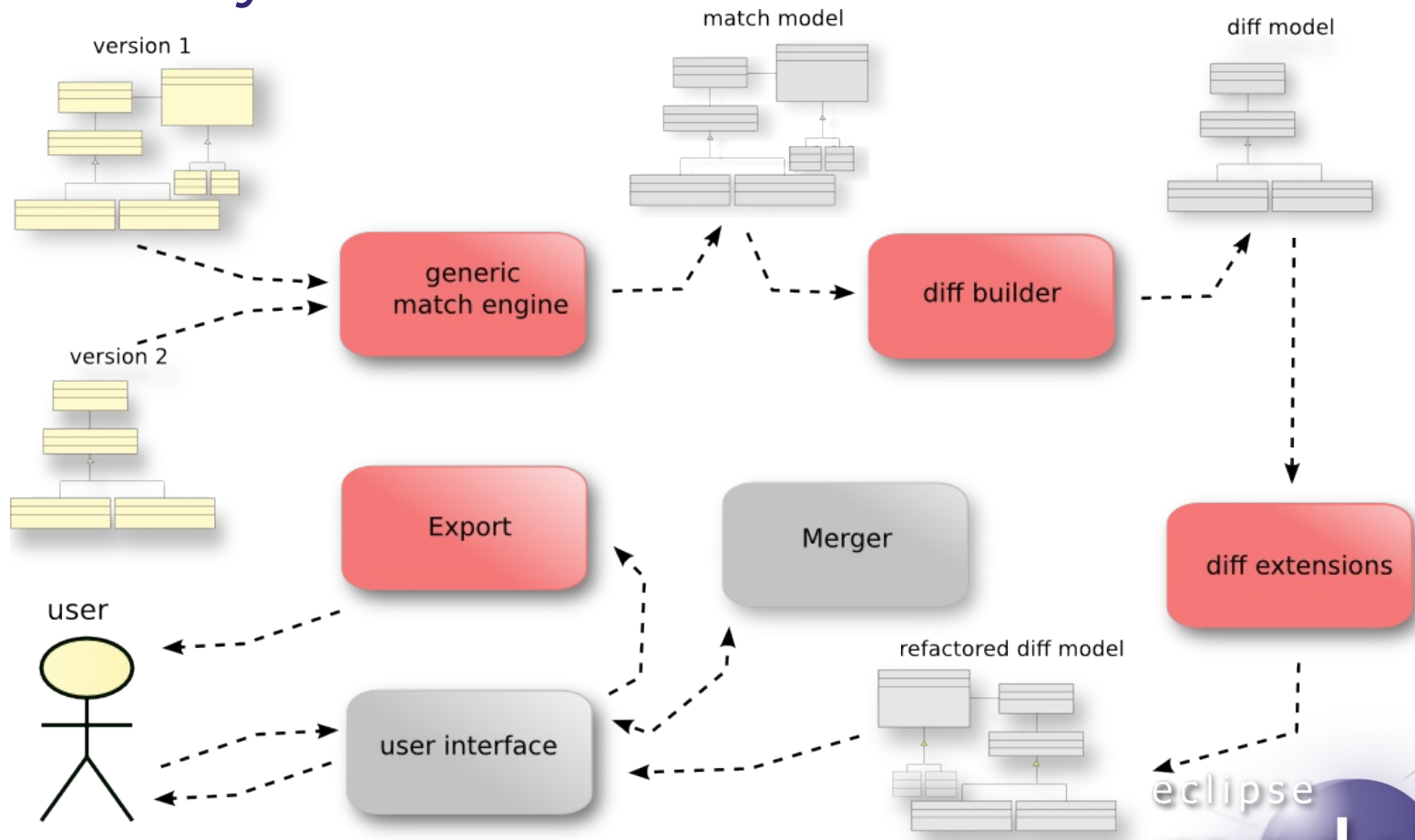
Diff model export

- export a model containing « diff » and « match » model : emfdiff file



- ▼ ◆ Model Input Snapshot Sun Oct 07 19:46:02 CEST 2007
 - ▼ ◆ Diff Model /resource/org.eclipse.emf.compare.tests/i
 - ▼ ◆ Diff Group 70
 - ▶ ◆ Diff Group 70
 - ▼ ◆ Match Model /resource/org.eclipse.emf.compare.test
 - ▼ ◆ Match2 Elements 0.9981769904490151
 - ▶ ◆ Match2 Elements 1.0
 - ▶ ◆ Match2 Elements 1.0
 - ▶ ◆ Match2 Elements 1.0

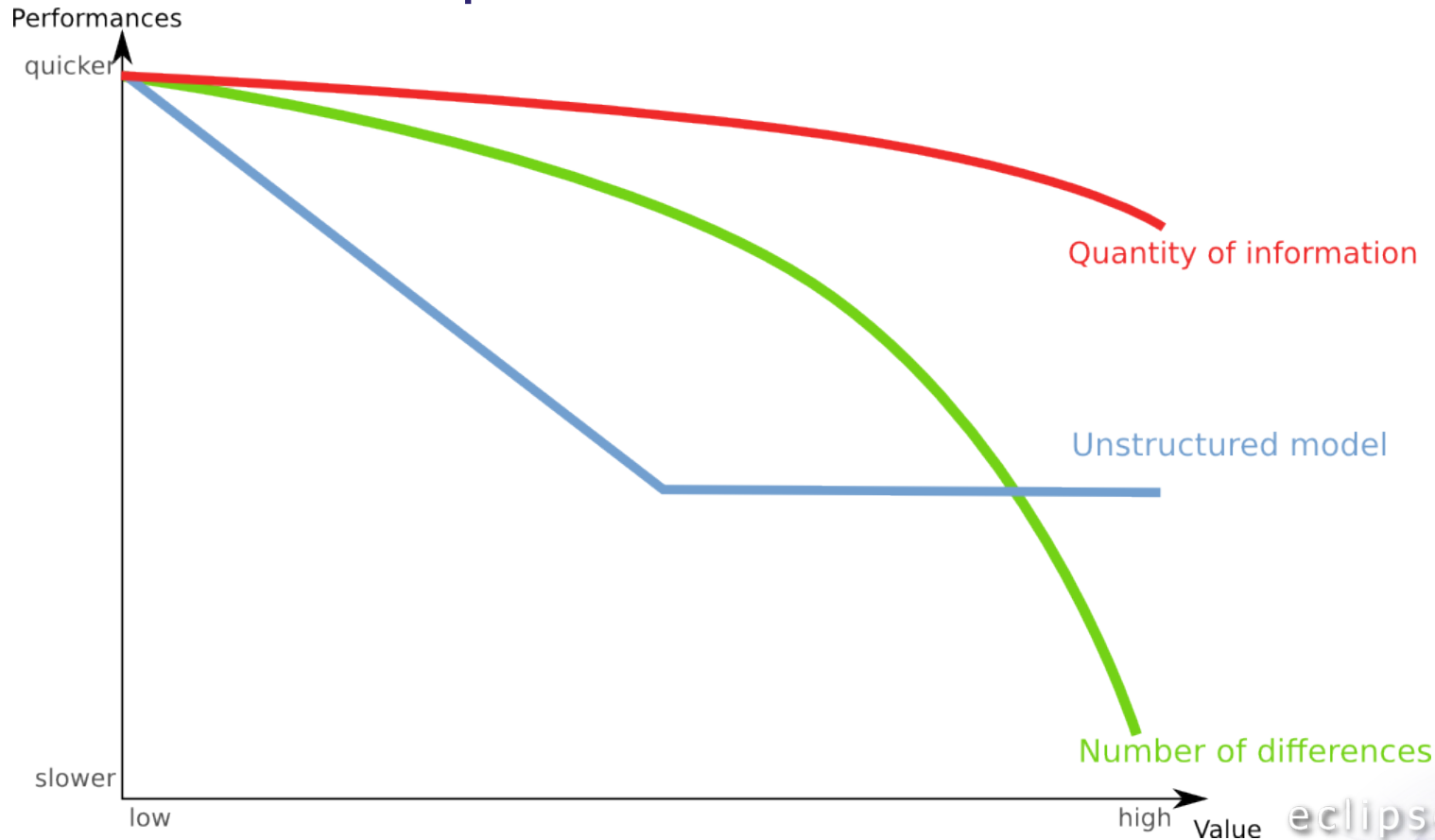
Extensibility



Performances : figures

- UML model
 - UML2.0, 130+ elements : 0.3 second
 - UML2.0, 4600+ elements : 1 second
 - UML1.3, 65 000+ elements : 4 minutes
- Ecore model
 - gmfgraph.ecore, 450+ elements : 1 second
 - gmfggen.ecore, 1200+ elements : 3 seconds
 - 6000+ elements, very flat model : 20 seconds
 - 45 000+ elements : 4 minutes

Performances parameters



Current status

- 0.7.0 stable release
 - merge/differencing
 - reference documentation
 - « 2 way » comparison
 - Ecore/XMI Id handling
 - metamodel agnostic
 - match engine extensibility
 - export API
- 0.8.0 interim builds
 - « 3 way » comparison
 - diff engine extensibility
 - diff model extension
 - performances enhancements
- Community
 - « up-to-date » doc is in the wiki
 - great feedbacks
 - bugs and enhancements requests
 - patches
 - coming soon : release review
- Eclipse.org
 - automated builds



What's next ?



Roadmap

- 0.8.0 release
 - 3 way comparison
 - diff model extension
 - diff engine extensibility
 - tutorial documentation

- Ganymede simultaneous release
 - stability/efficiency
 - other tools integrations
 - API validation

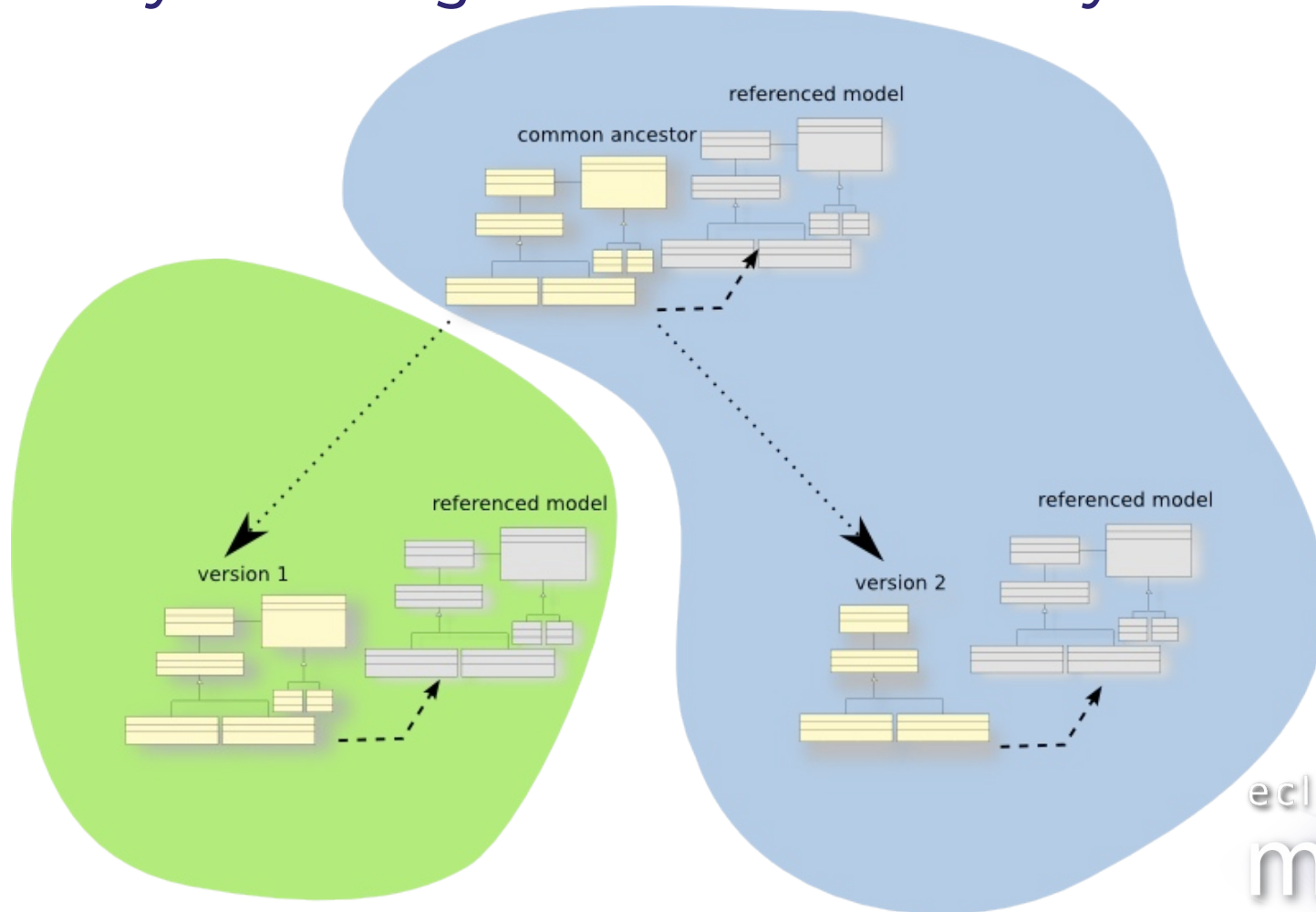


Alternatives engines and settings

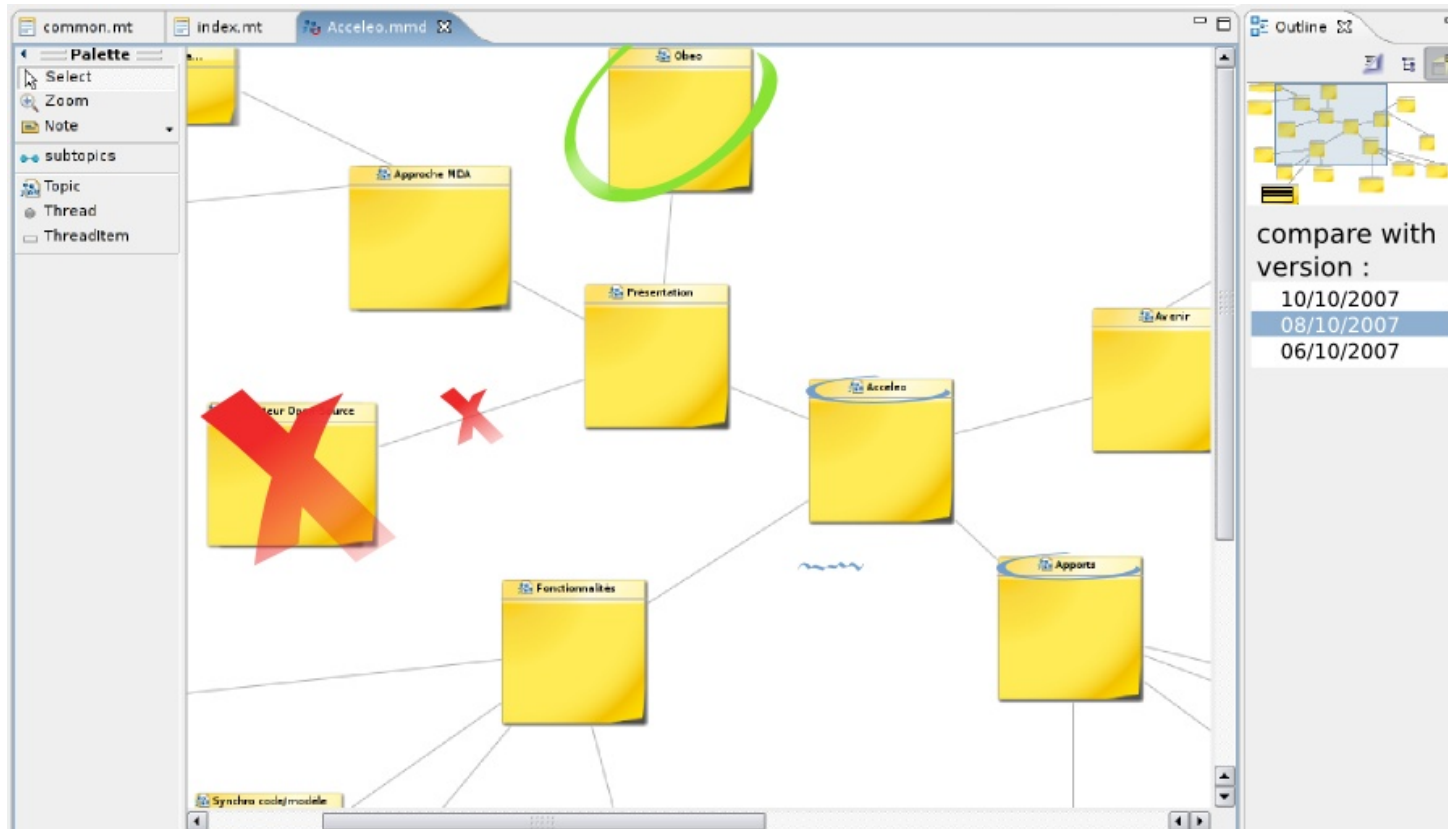
- specific properties (big models...)
- performances
- weight-based engine



Proxy resolving on version control systems



Integration in modelers



Thanks for your attention, any question ?

- Further information :
 - <http://www.eclipse.org/modeling/emft/?project=compare#compare>

