

# EMF Comparison Framework

*One year later ...*

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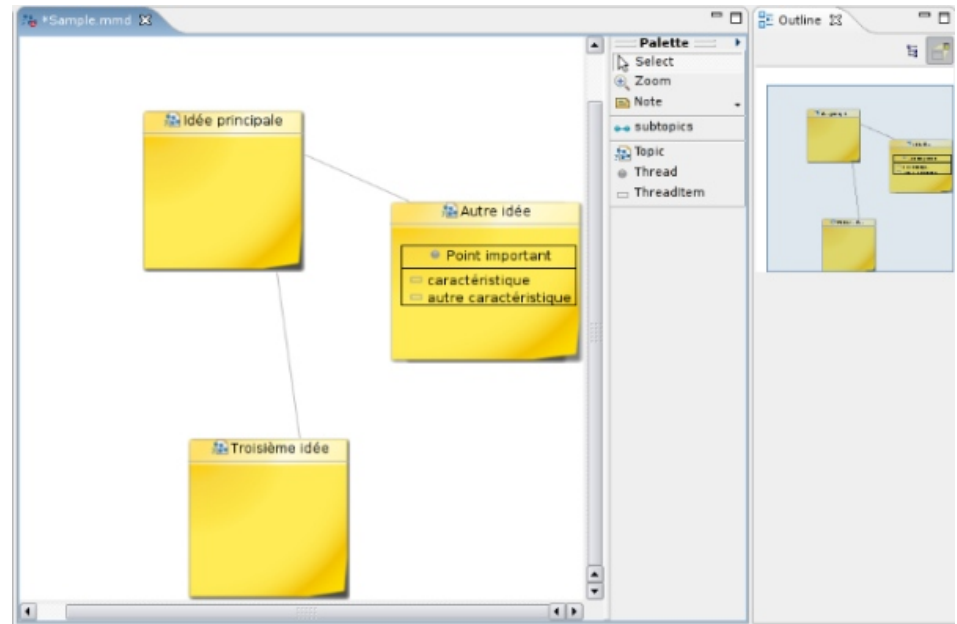


## Working with models in Eclipse ?



# 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 ?

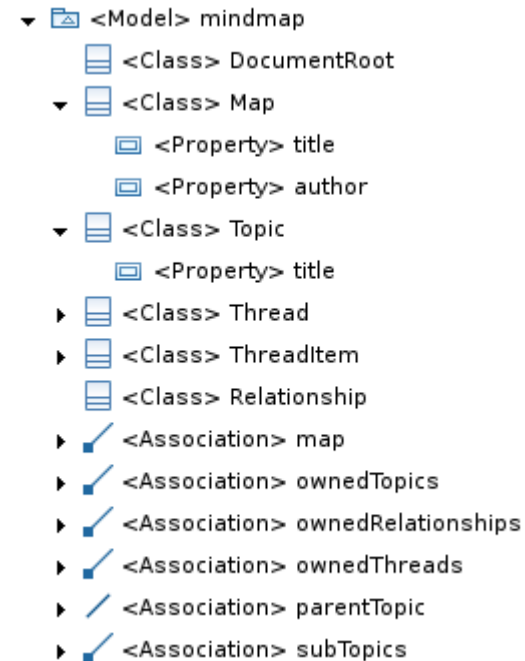
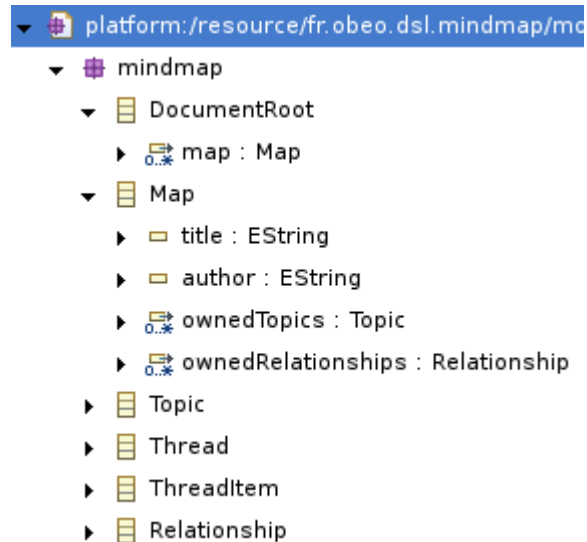
▶ Topic History

▶ 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

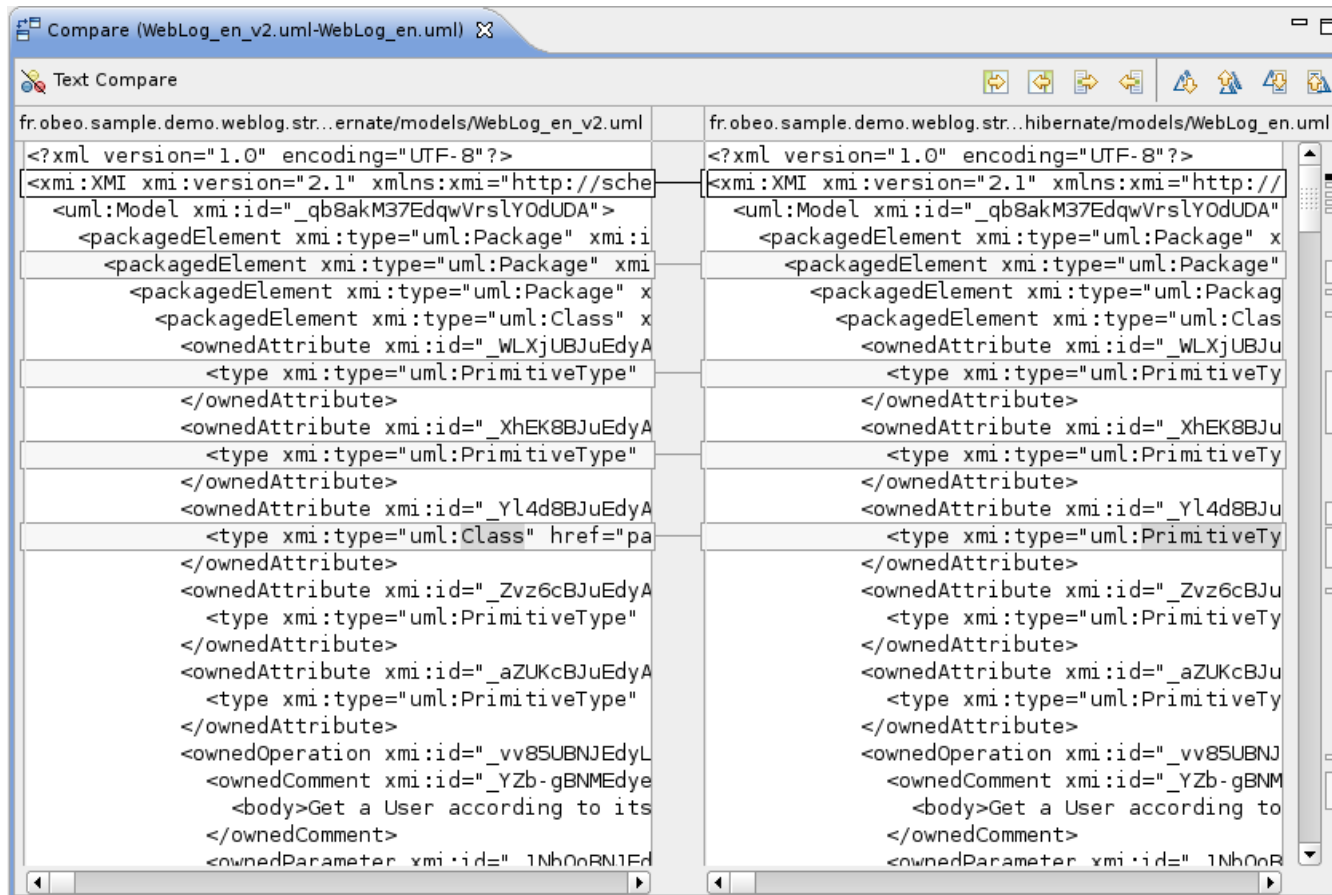


UML Tools, Query/Transaction/Validation, ...

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.

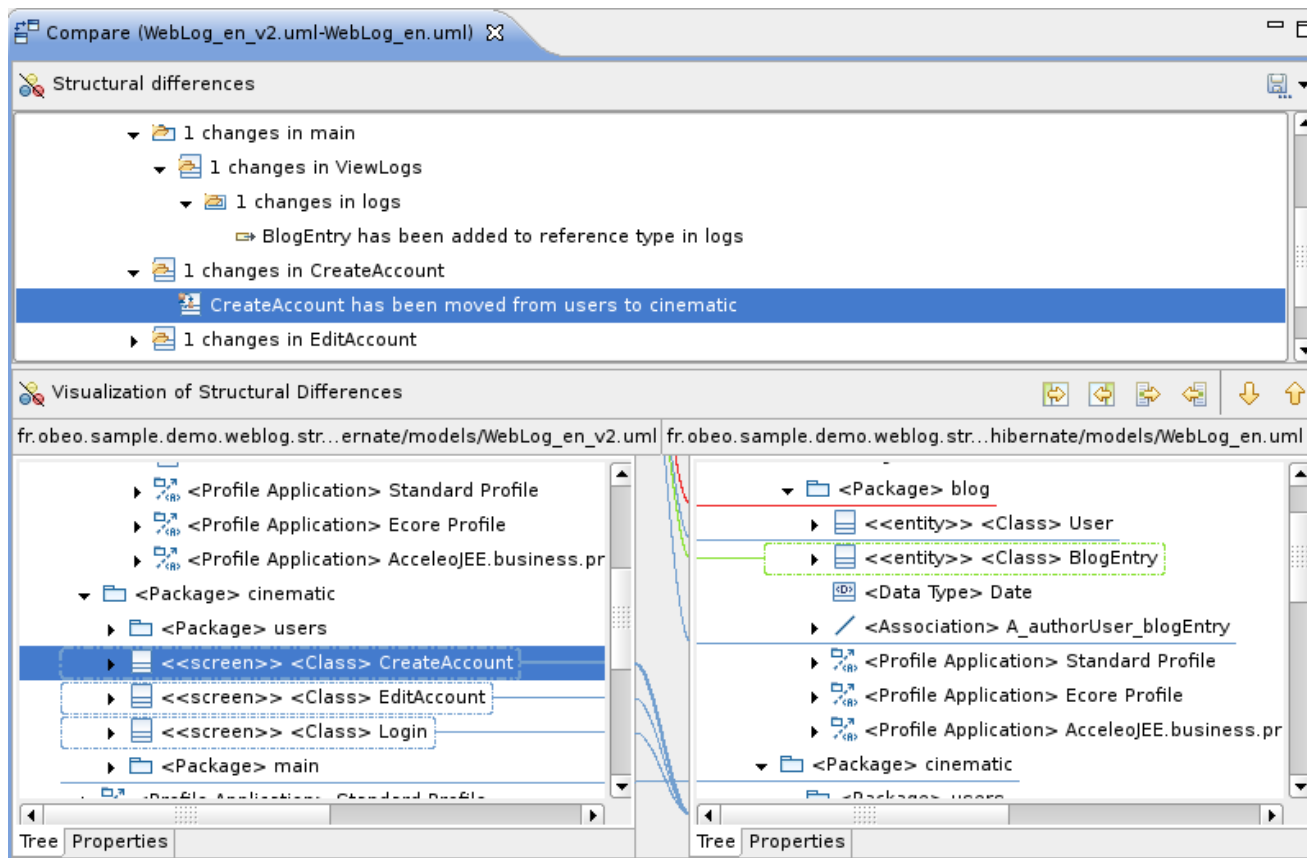
Obeo and Intalio contribute their own initial implementations



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

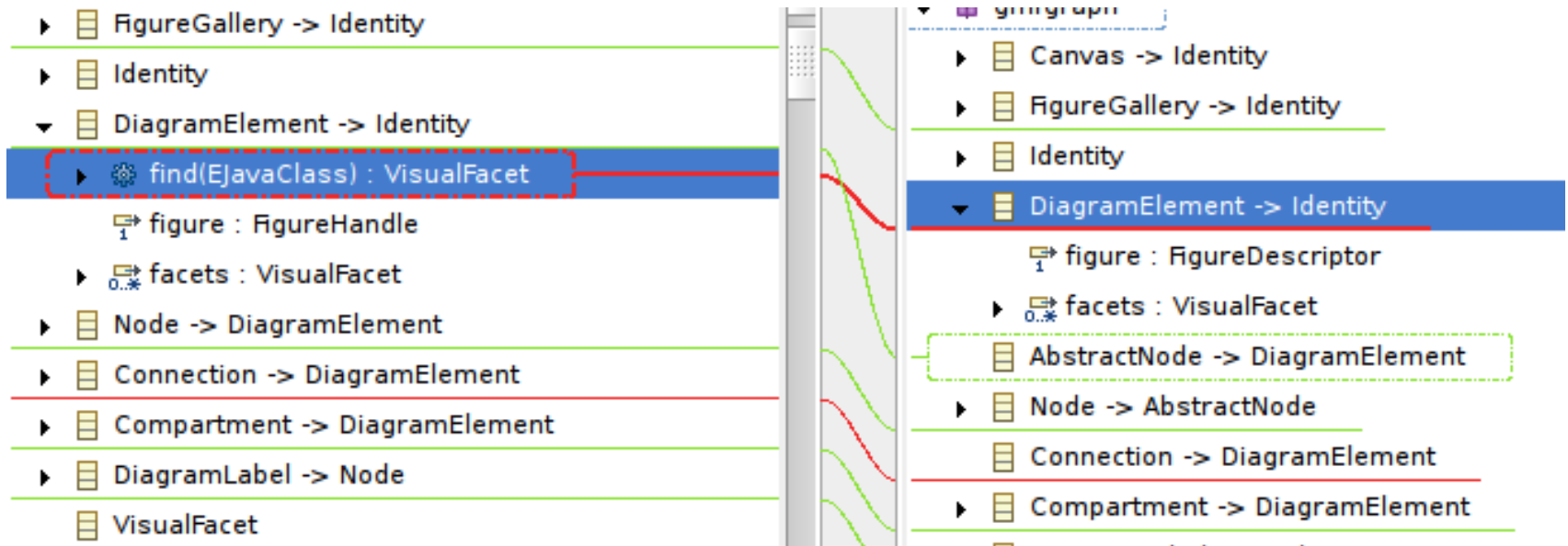


Why should you bother ?



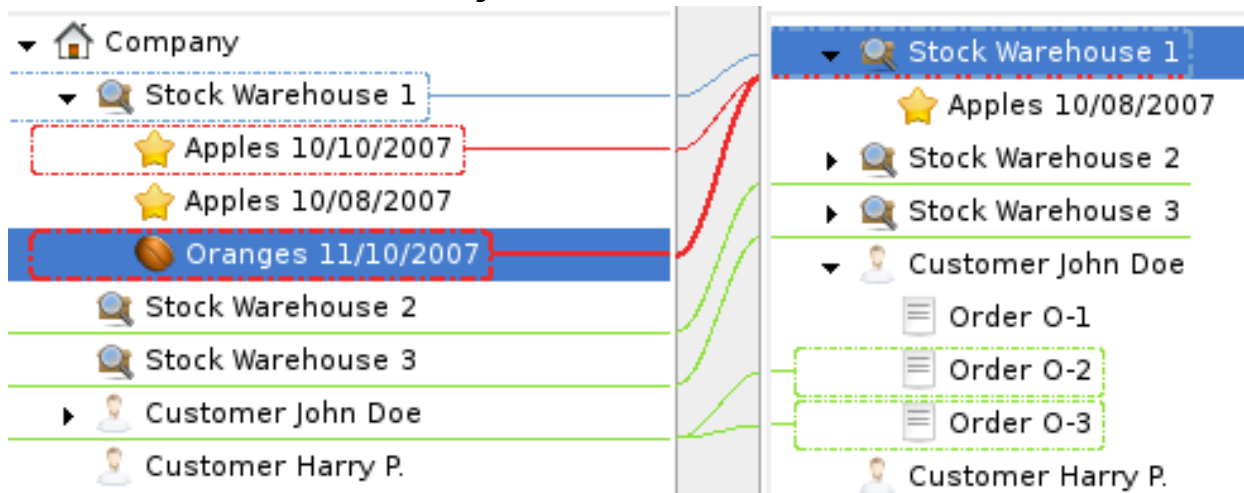
# As an Eclipse user

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

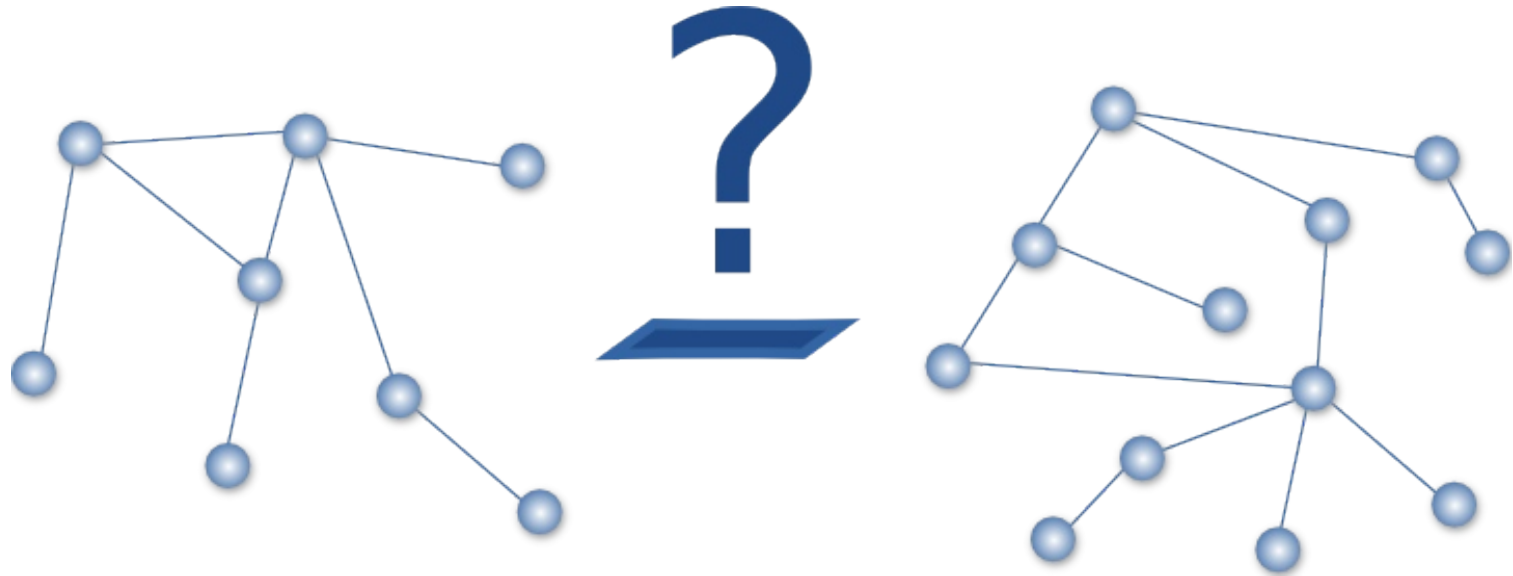
« mymodel » support

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

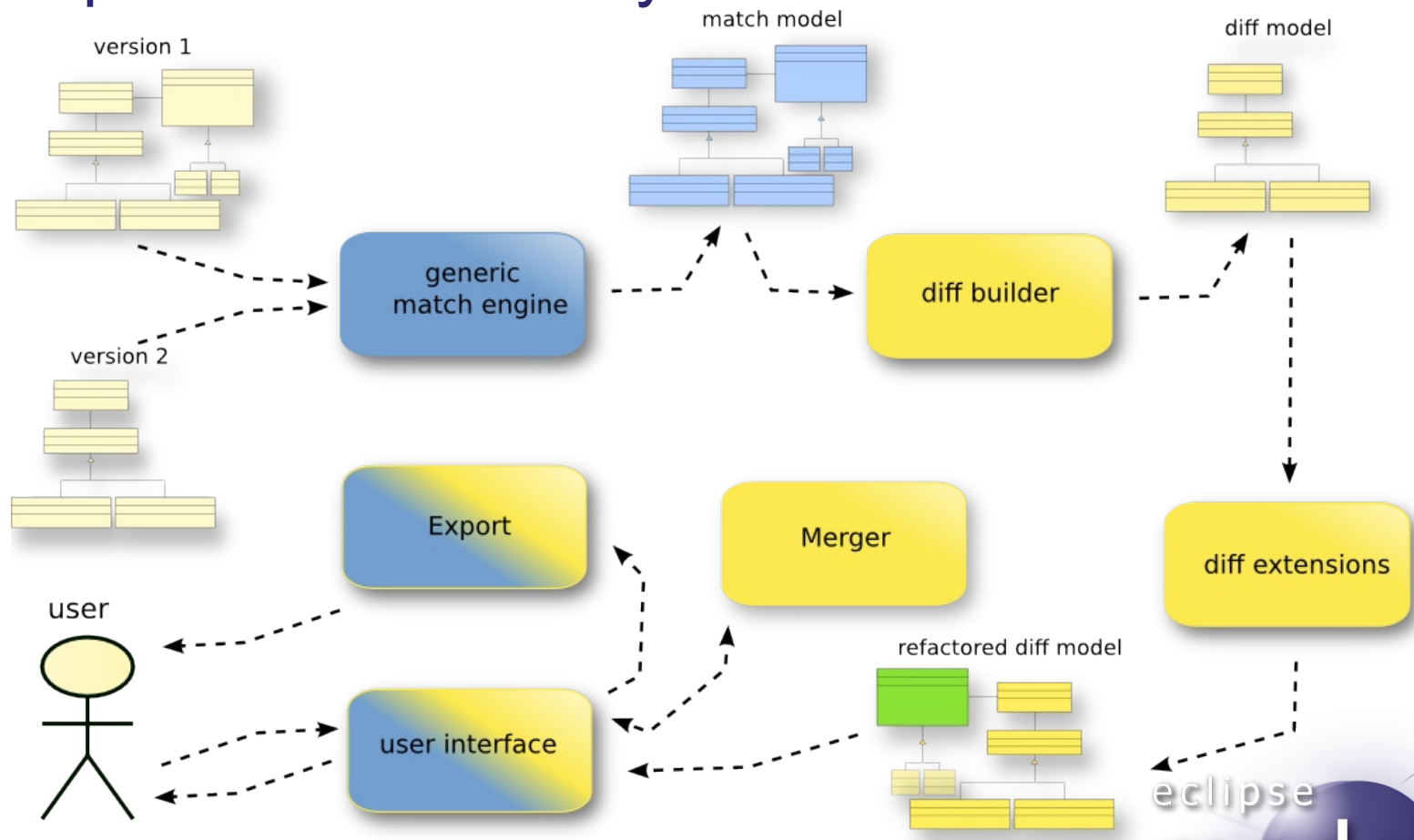




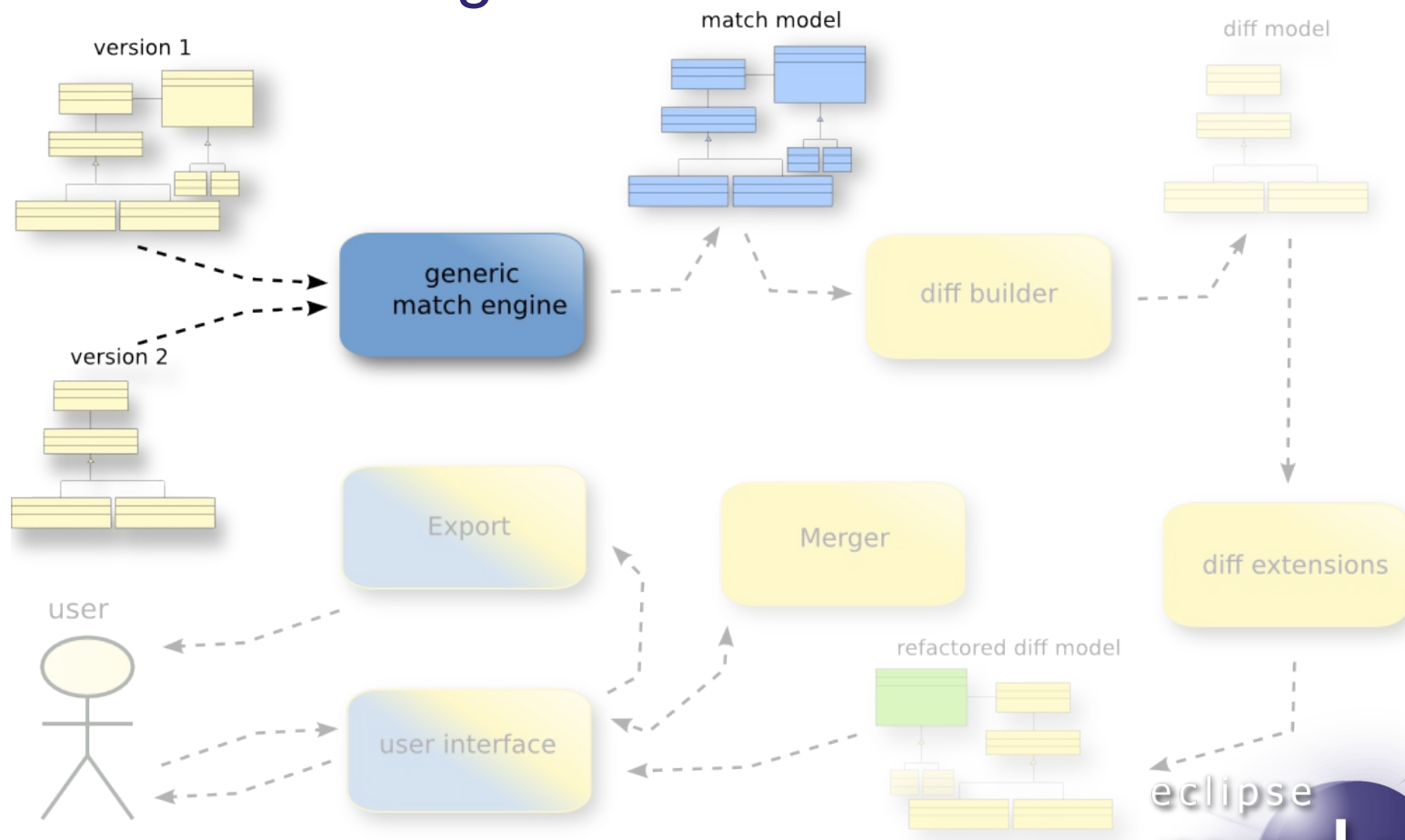
How does it works ?



# Principles : models everywhere



## Phase 1 : matching elements



## Match engine

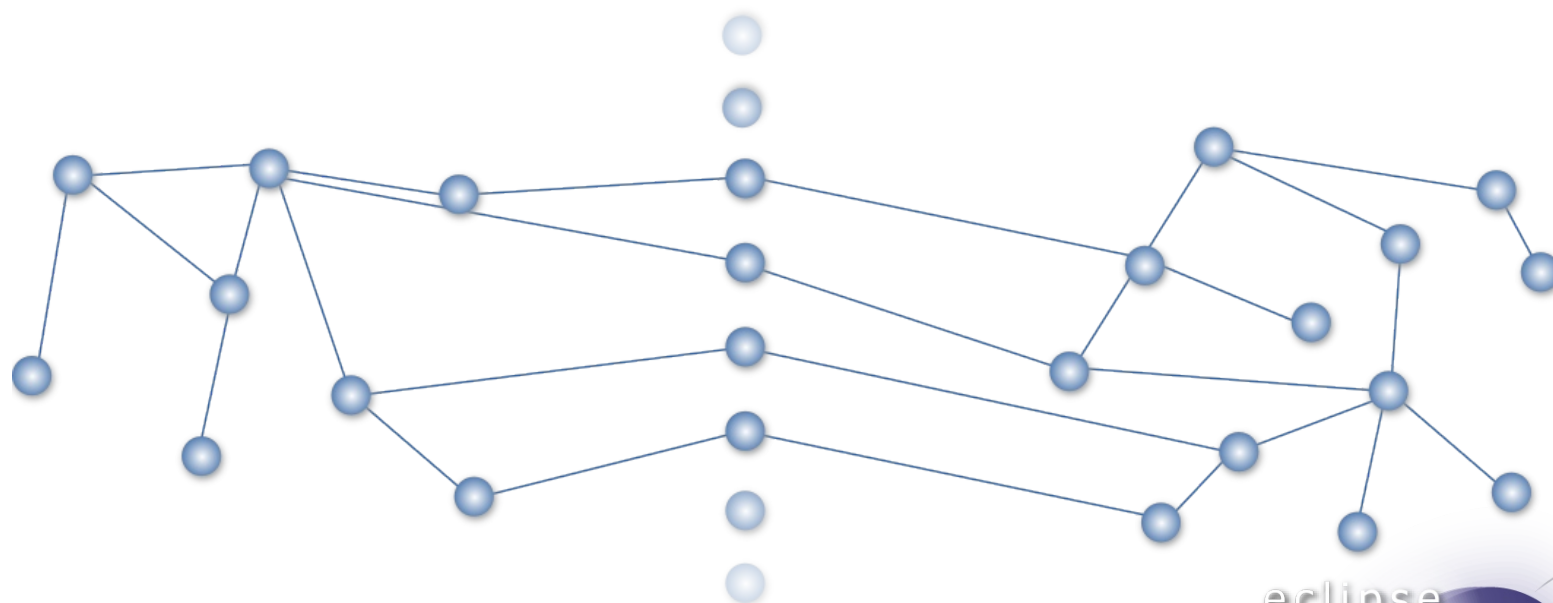
are « a » & « b » similars ?

produce a match model

version 1

match model

version 2



# Generic matching engine

heuristic based

metamodel agnostic

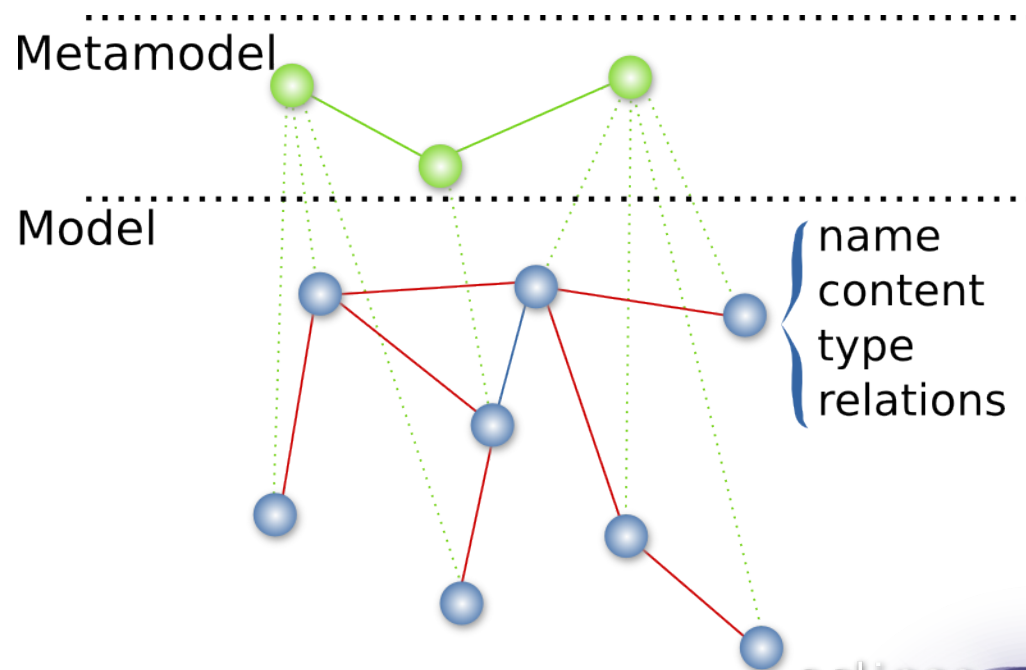
4 metrics

name

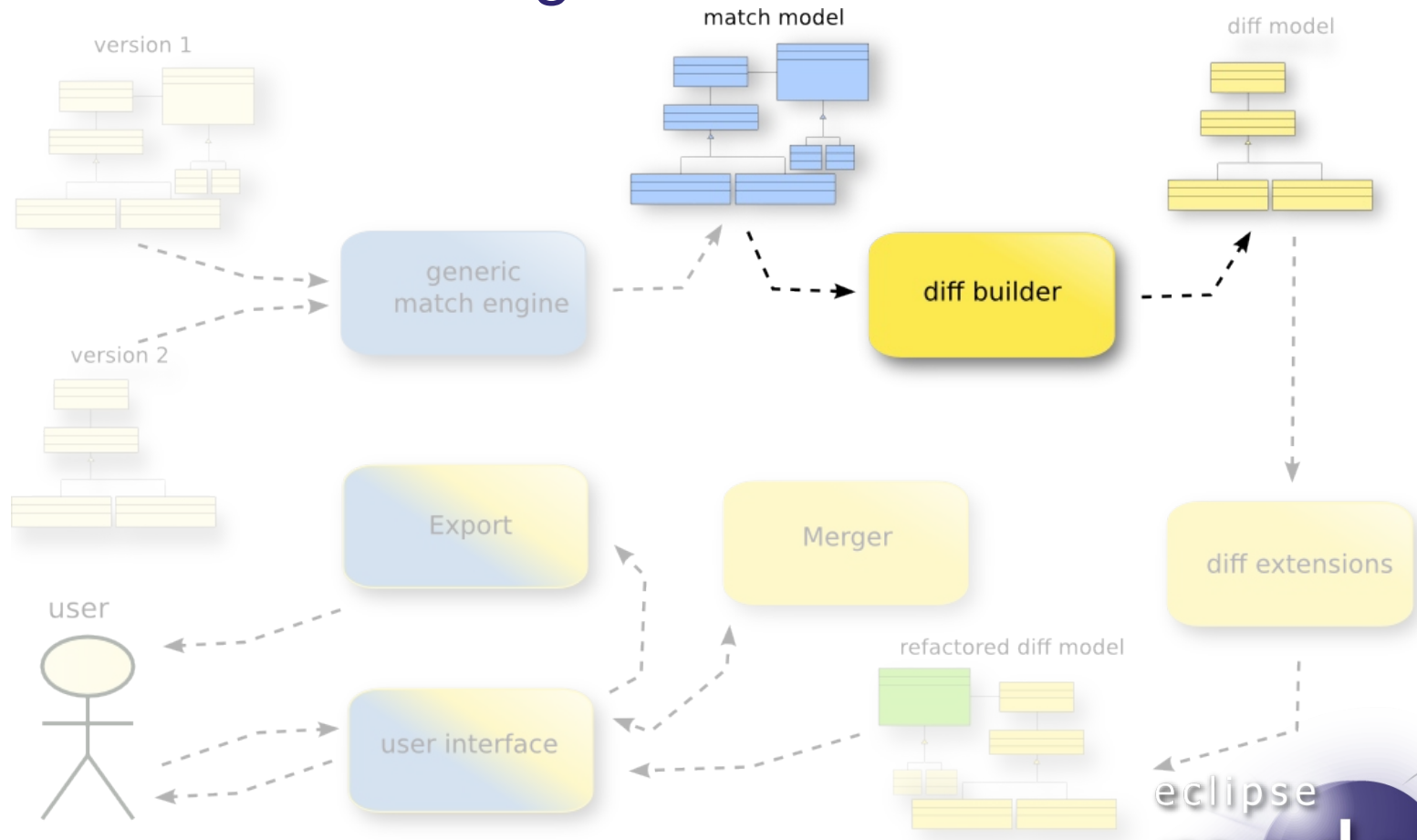
content

type

relations



## Phase 2 : differencing



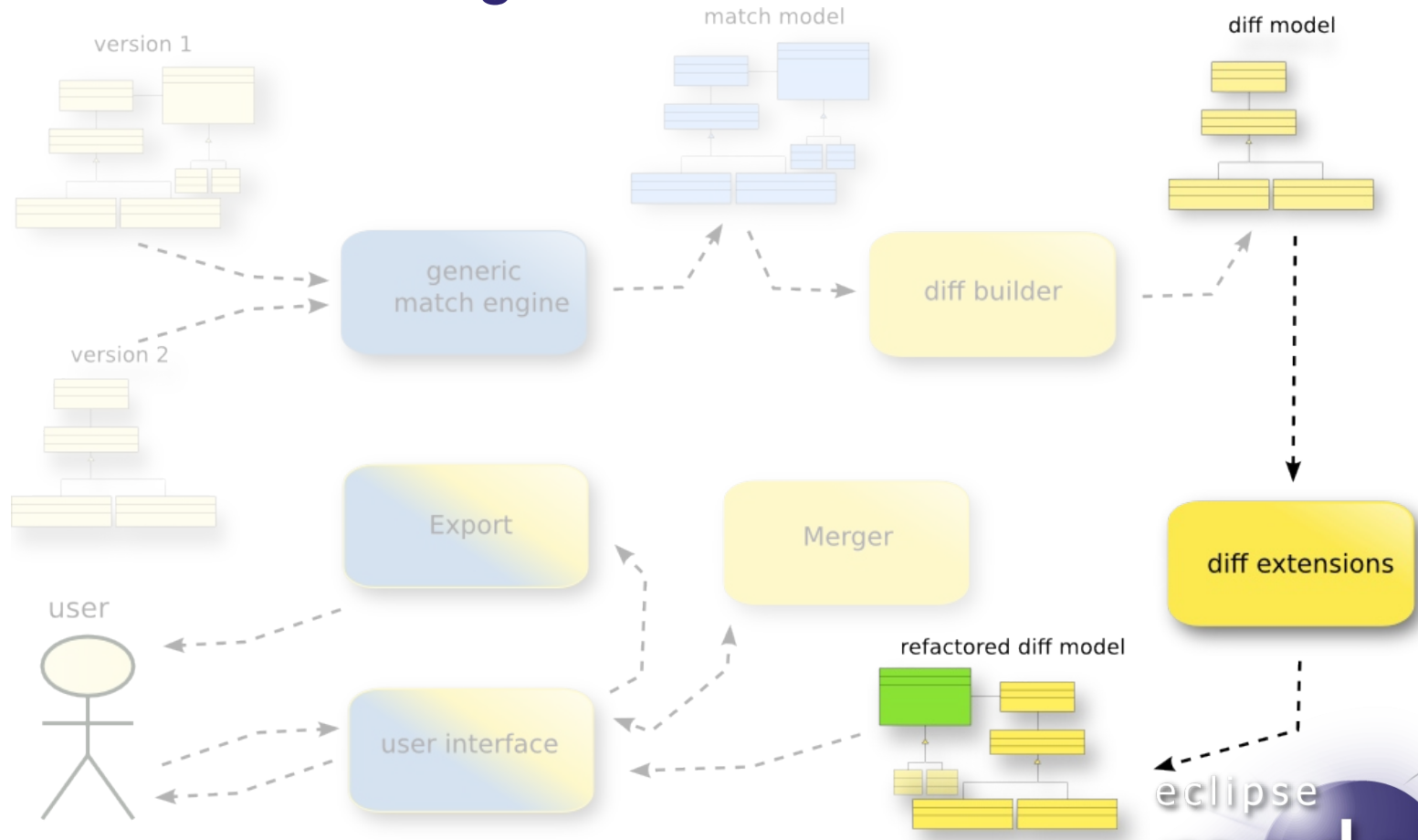
# Differencing engine

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

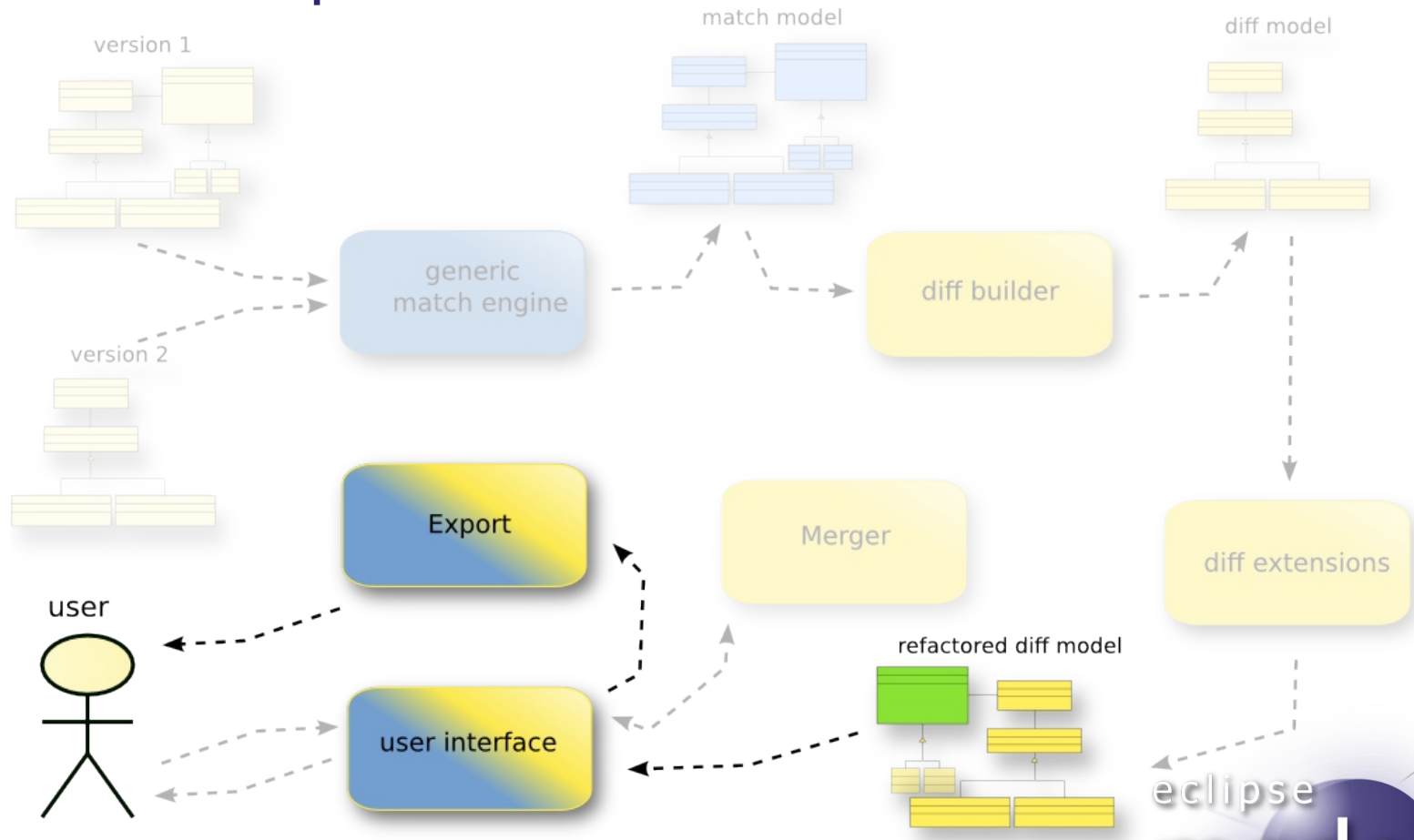


## Phase 3 : extending the diff model



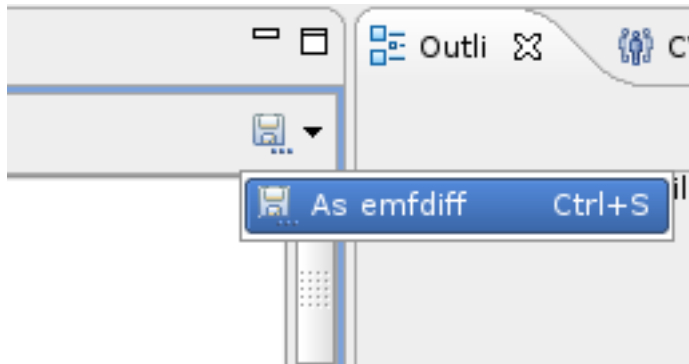


# Diff model export



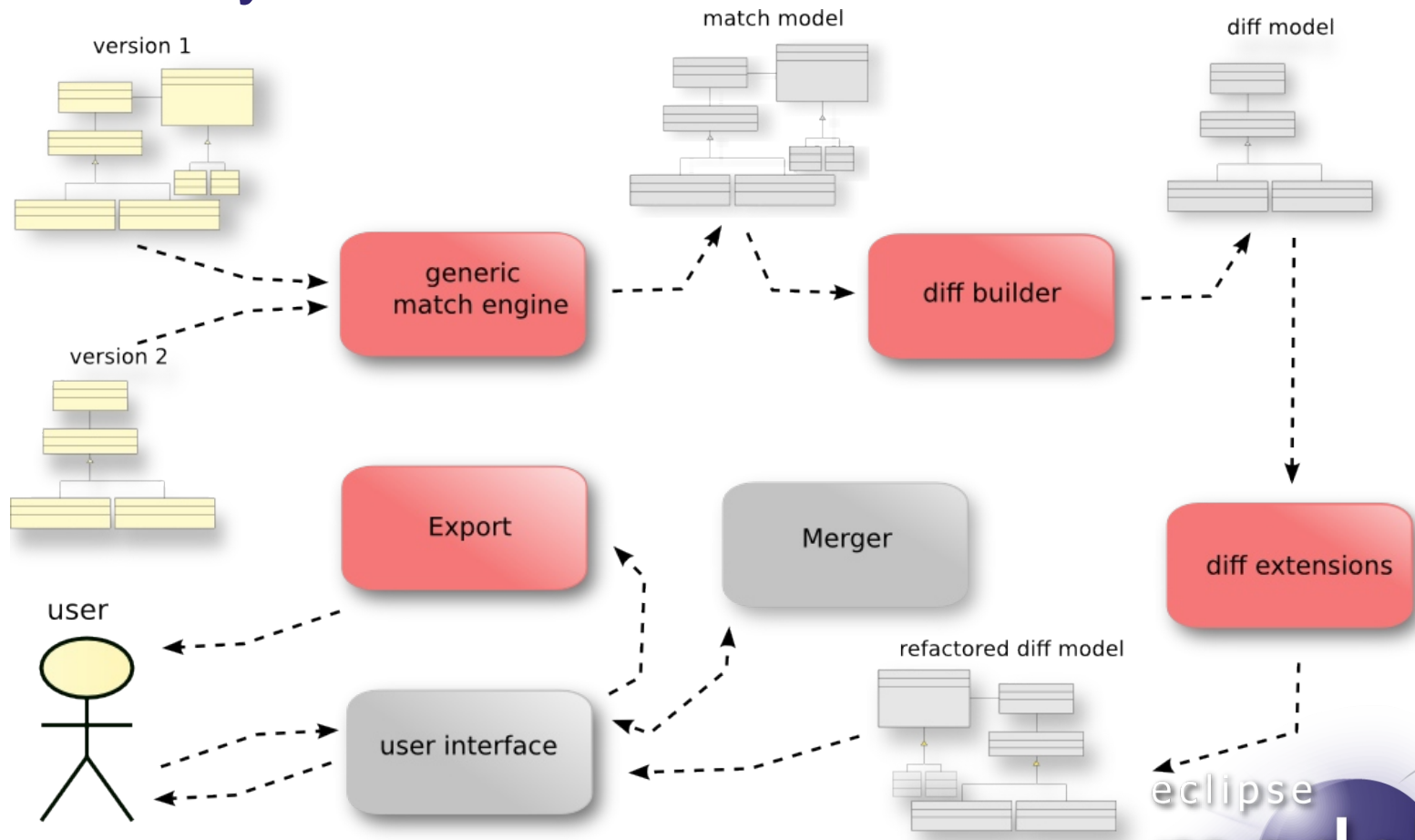
## Diff model export

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

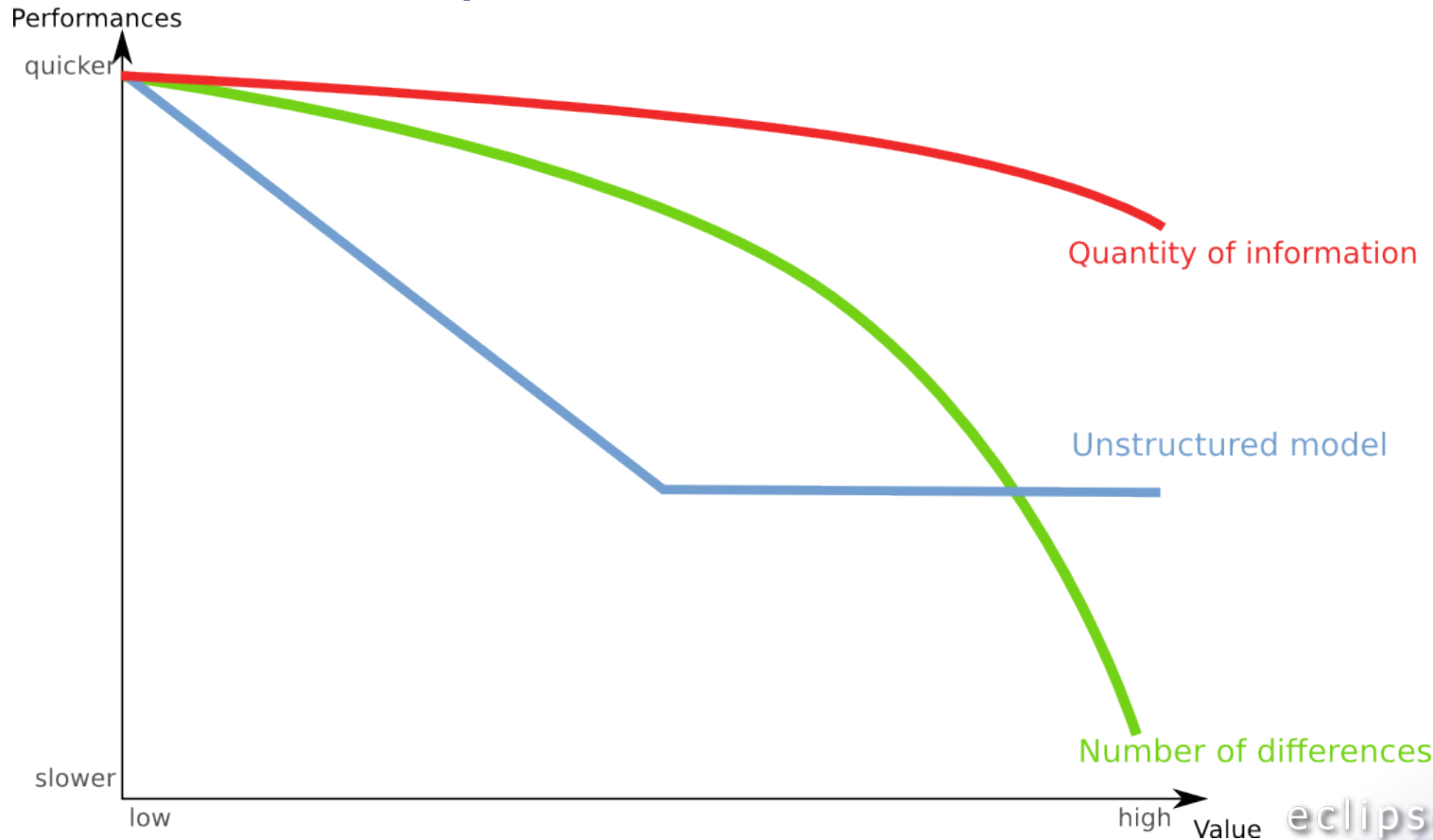
gmfgraph.ecore, 450+ elements : 1 second

gmfgen.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 (end of the year)

- 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

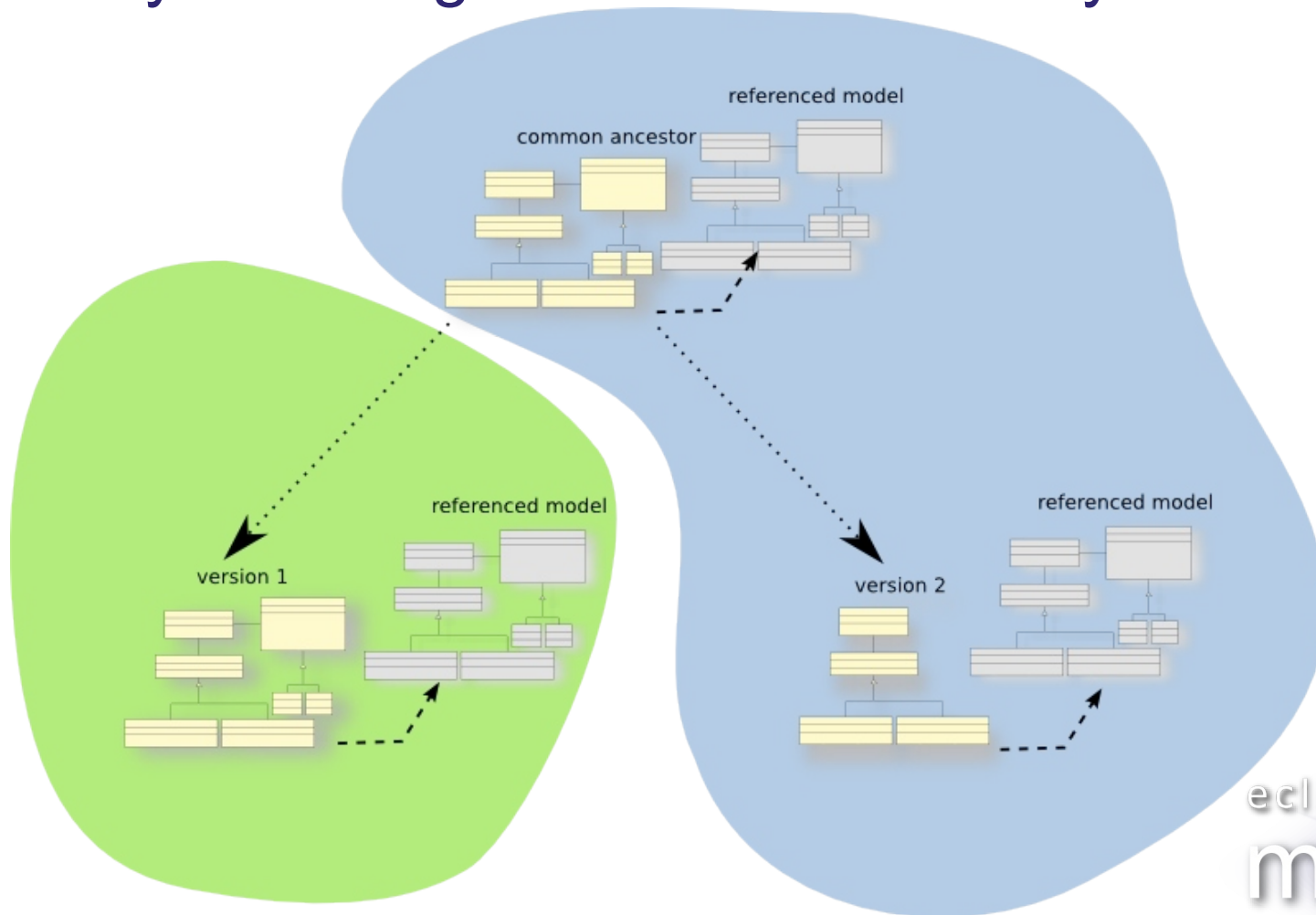
specific properties (big models...)

performances

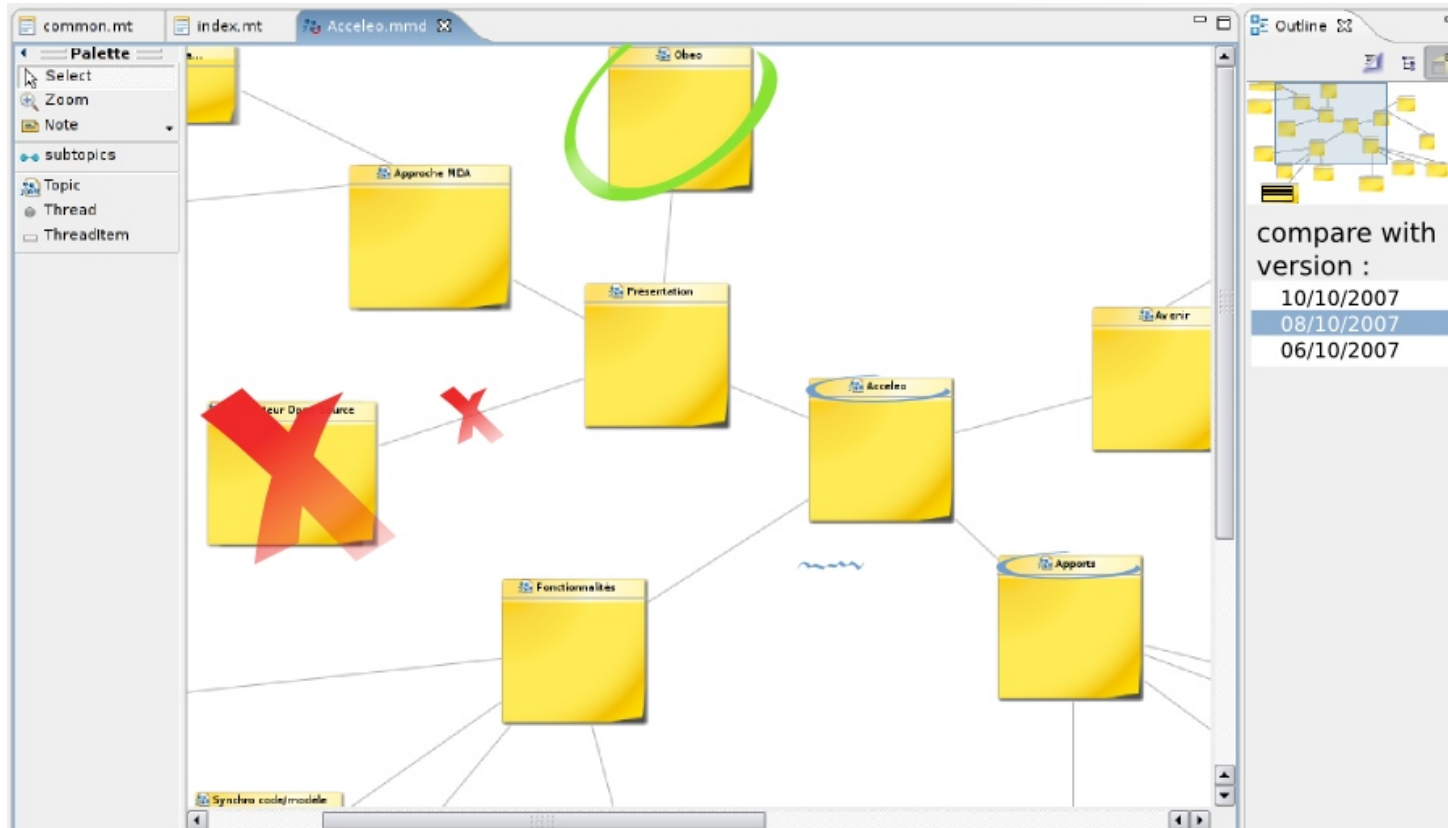
weight-based engine



# 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>

