

Comparing and Merging Models with Eclipse

An update on EMF Compare ...

Cédric Brun

Obeo France





Working with models in Eclipse ?

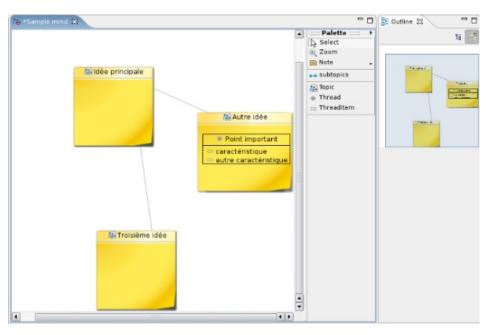




EMF / GMF : modeling support

- 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







- 👻 🐉 platform:/resource/free.demo.mindmap/model/ESE2007.mindmap
 - 👻 🌇 Map Eclipse Summit Europe 2007

eclipsecon[™] 2008

- 🔝 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 ?

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M2M : transform models to models

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- 🛨 🌐 mindmap
 - 🛨 📄 DocumentRoot
 - 🕨 📑 map : Map
 - 🛨 📄 Map
 - 🕨 🗖 title : EString
 - 🕨 🗖 author : EString
 - ▶ 📑 ownedTopics : Topic
 - 🕨 📑 ownedRelationships : Relationship
 - 🕨 📄 Topic
 - 🕨 📄 Thread
 - 🕨 📄 Threaditem
 - 🕨 📒 Relationship

- 🛨 📩 <Model> mindmap
 - 📃 <Class> DocumentRoot
 - 🛨 📃 <Class> Map
 - 💷 <Property> title
 - 💷 <Property> author
 - 👻 📃 <Class> Topic
 - 💷 <Property> title
 - 🕨 📃 <Class> Thread
 - 🕨 📃 <Class> ThreadItem
 - Class> Relationship
 - Association> map
 - Association> ownedTopics
 - </p

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- Association> ownedThreads
- / <Association> parentTopic
- Association> subTopics
- UML Tools, Query/Transaction/Validation, ...



Have a try ?



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No team-work support

Text Compare	🔛 🔄 🖻 🖧 🎪 🕸 🖗						
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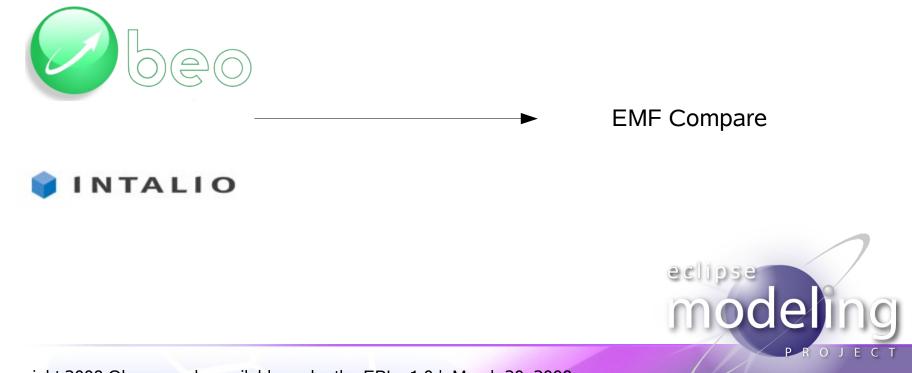
Back in 2006...





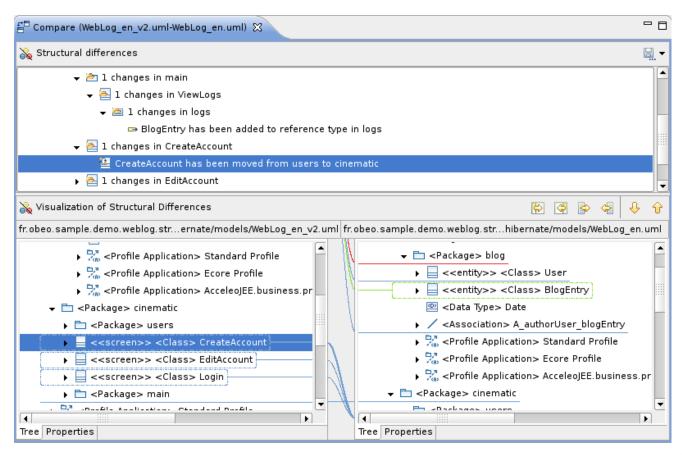
Eclipse Summit Europe 2006

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





Result?



- differencing
- merging
- team API integration
- diff export

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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 »





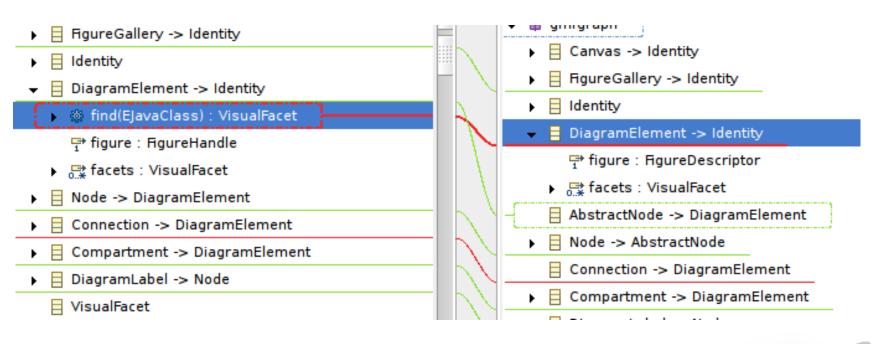
Why should you bother ?





As an Eclipse user

develop using models !



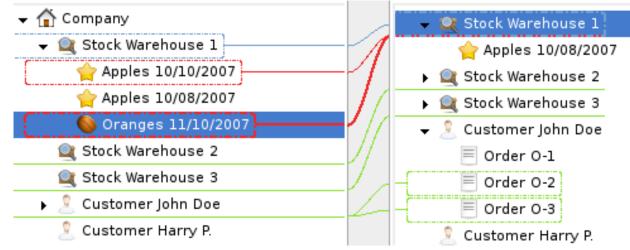
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As an RCP developer

compare your own business objects



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

eclipse modeling PROJECT



As an « development tools » developer

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

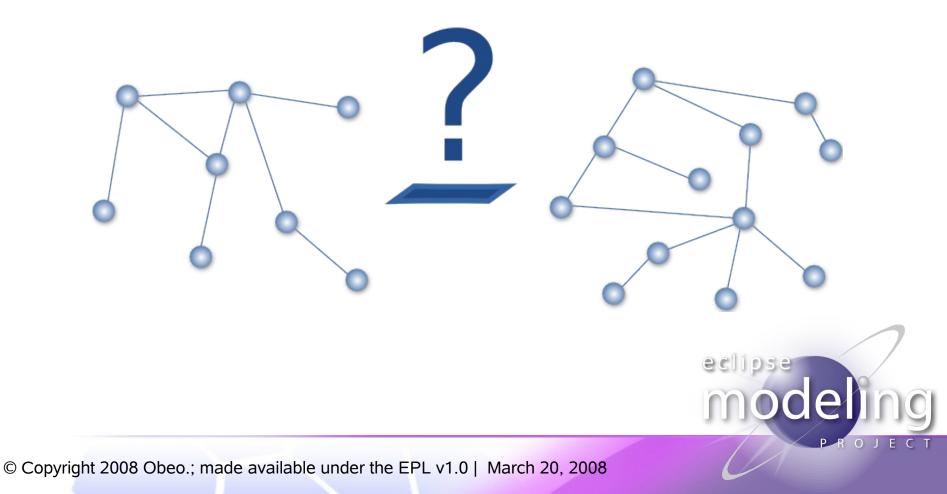
```
<extension
point="org.eclipse.core.contenttype.contentTypes">
<content-type
    id="org.eclipse.emf.compare.ui.contenttype.ModelContentType"
    name="Model File"
    priority="normal"
    file-extensions="mymodel">
    </content-type>
</extension>
```





As a researcher

testbed for models/graphs comparison algorithmes

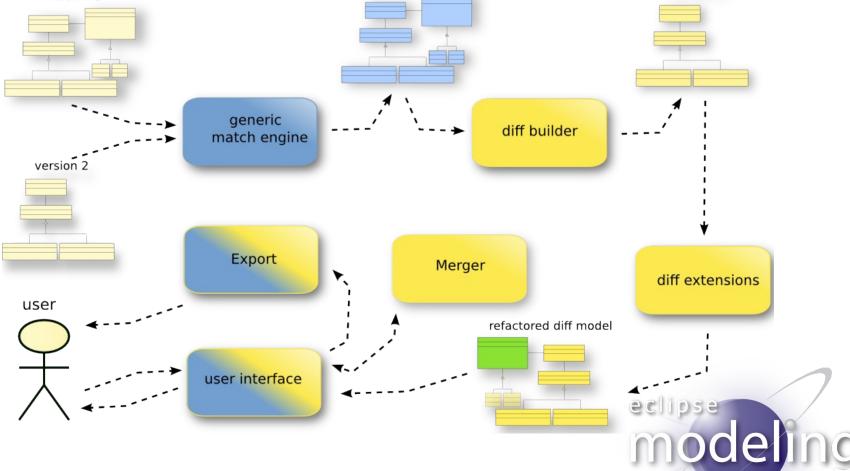




How does it work ?

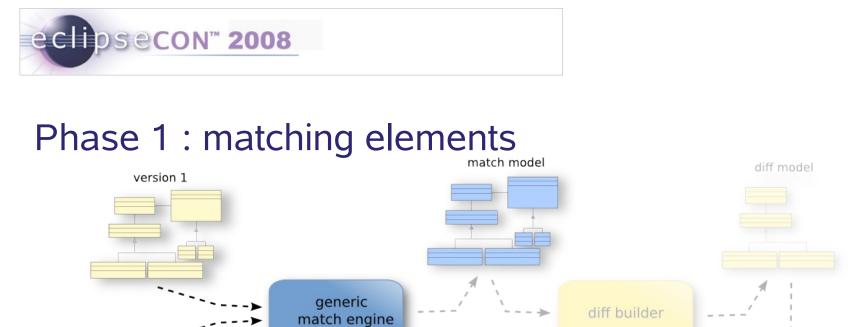






diff model

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Merger

refactored diff model

diff extensions

del

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eclipse

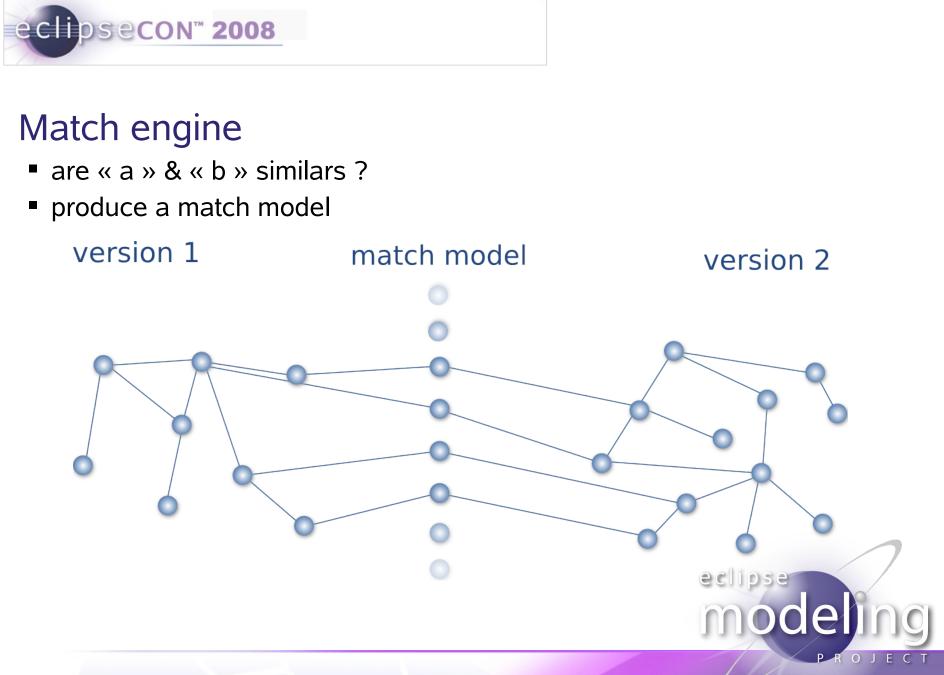
© Copyright 2008 Obeo.; made available under the EPL v1.0 | March 20, 2008

Export

user interface

version 2

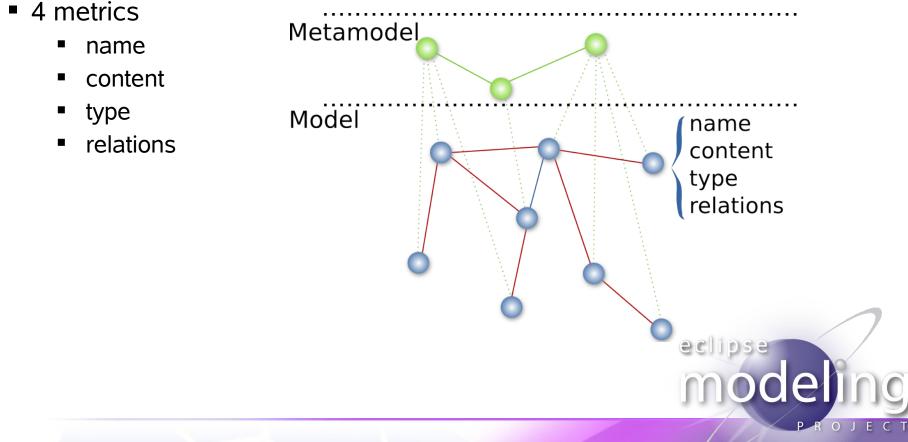
user





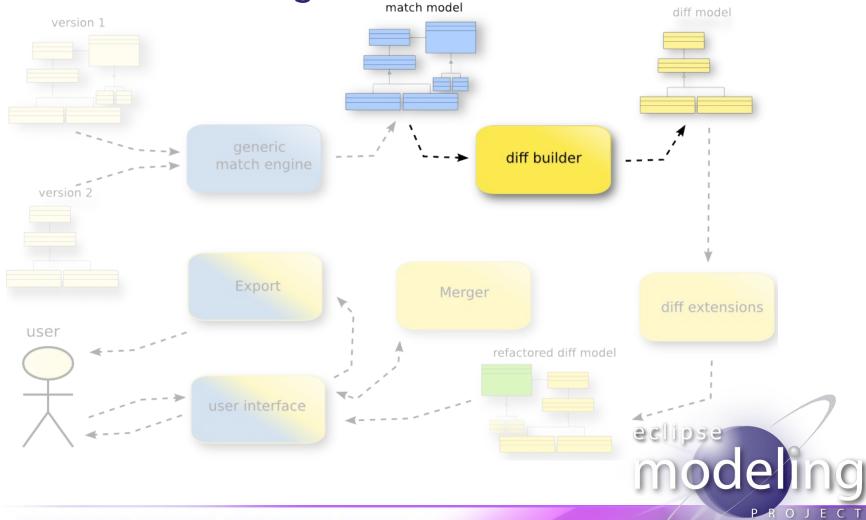
Generic matching engine

- heuristic based
- metamodel agnostic





Phase 2 : differencing





Differencing engine

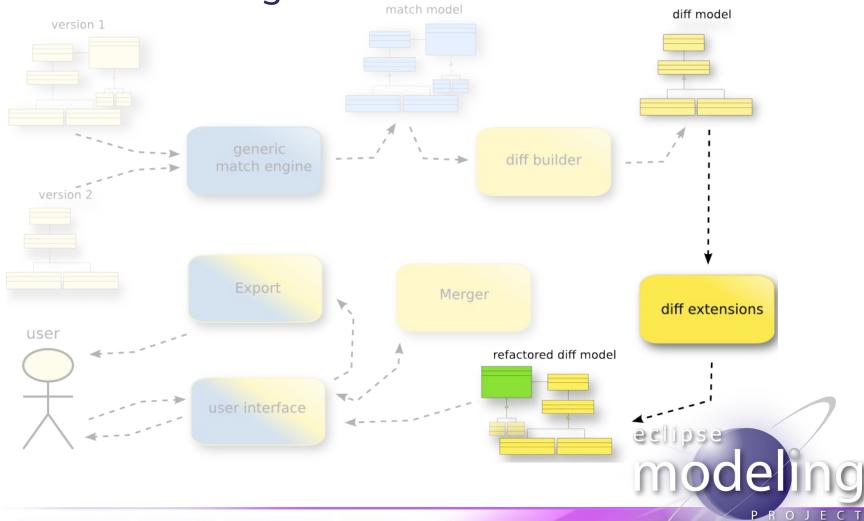
produces the diff model from the match model

- 👻 🍃 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
 - 探 GenElementInitializer has been removed from reference eType in modelElementInitializer
 - 探 typeModelFacet has been removed from reference eOpposite in modelElementInitializer
 - (見) EGenericType has been removed
 - 🕨 🖄 4 changes in ViewmapLayoutType
 - 👻 🔁 2 changes in Palette
 - 🕨 🕂 2 changes in groups



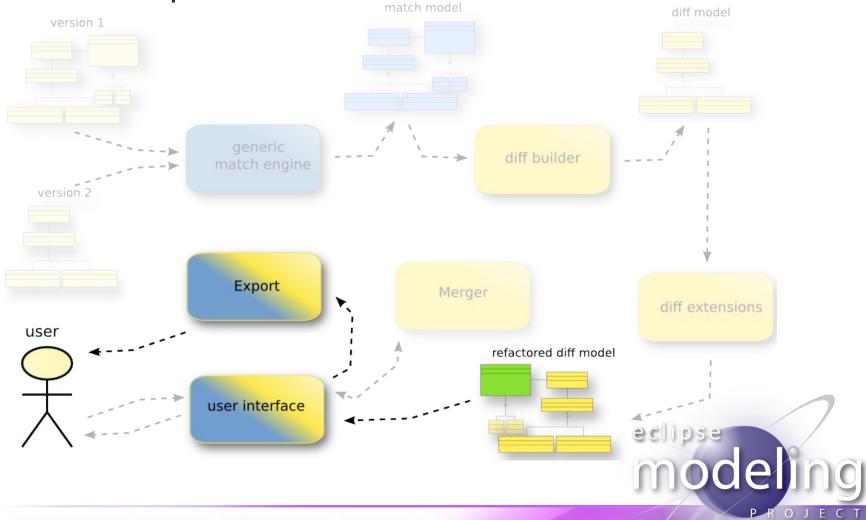


Phase 3 : extending the diff model





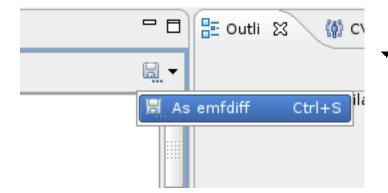
Diff model export





Diff model export

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

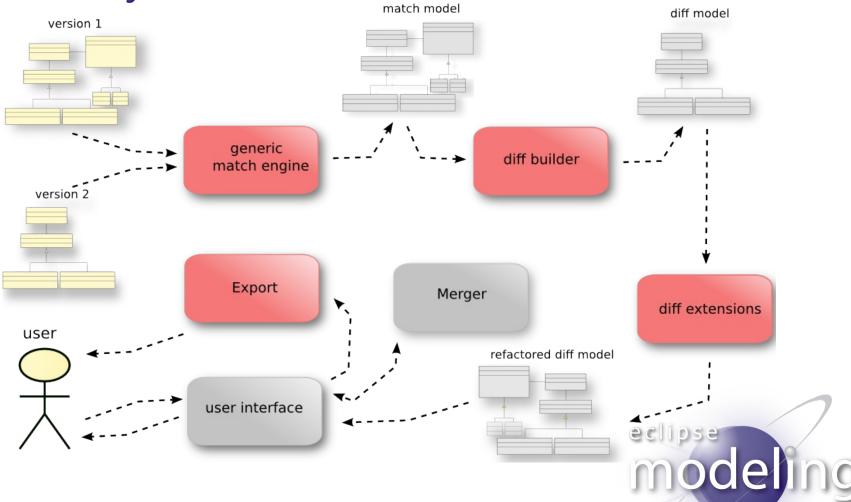


- Model Input Snapshot Sun Oct 07 19:46:02 CEST 2007
 - 🗸 💠 Diff Model /resource/org.eclipse.emf.compare.tests/i
 - 👻 🔶 Diff Group 70
 - 🕨 🔶 Diff Group 70
 - 🗸 🚸 Match Model /resource/org.eclipse.emf.compare.test
 - 🗕 🔶 Match2 Elements 0.9981769904490151
 - Match2 Elements 1.0
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 - 🕨 🔶 Match2 Elements 1.0





Extensibility



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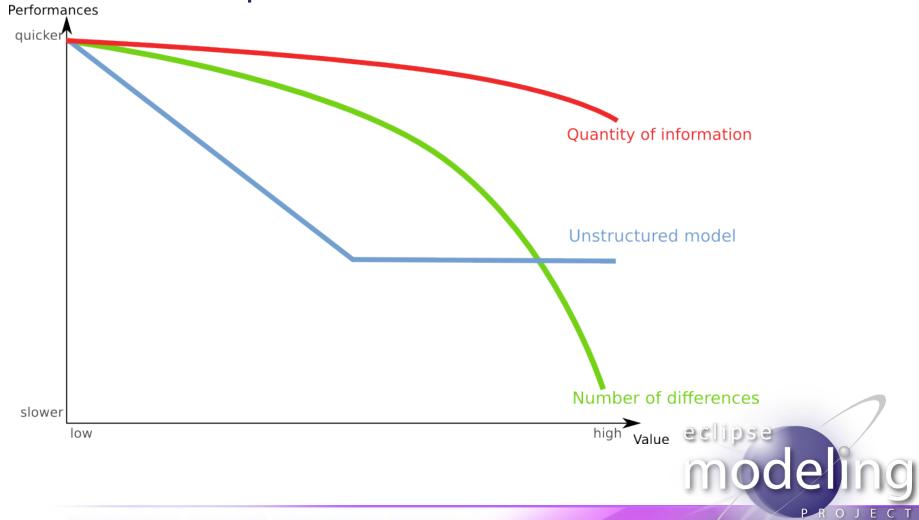
Performances : figures

- 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
 - 3 way comparison
 - diff model extension
 - diff engine extensibility
 - tutorial documentation
- Ganymede simultaneous release
 - stability/efficiency
 - other tools integrations
 - API validation





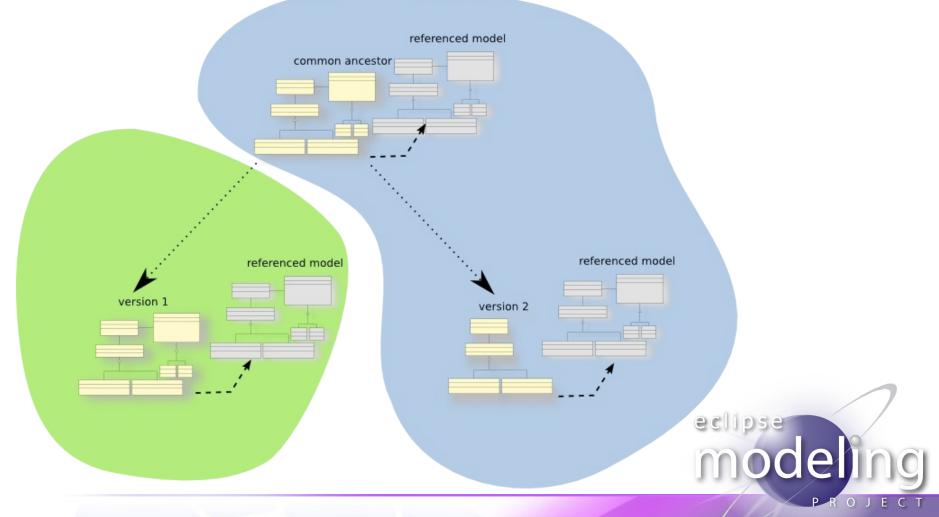
Alternatives engines and settings

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



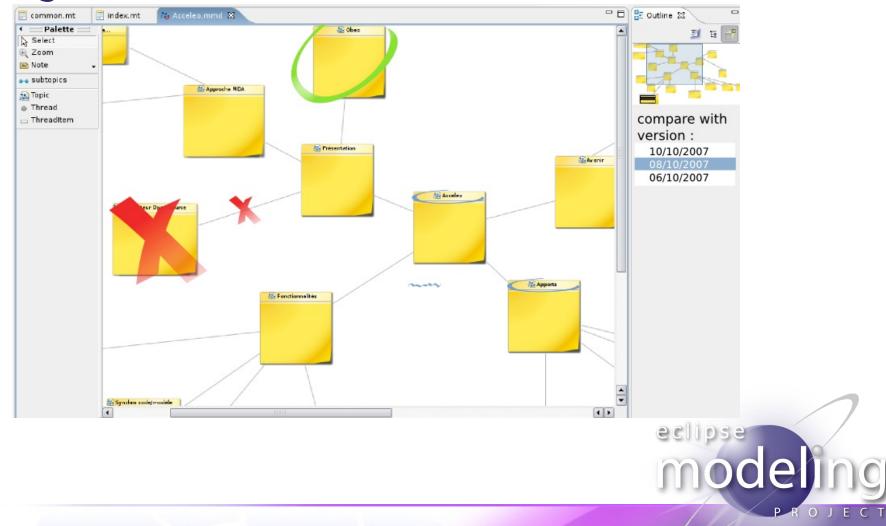


Proxy resolving on version control systems





Integration in modelers





Thanks for your attention, any question ?

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

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