Where there is modeling, there is merging

ECLIPSECON FRANCE, 24/06/2015
Model merging?

- Transfer data
- Align (totally/partially) model structures
- Report changes
- ...

+...

-...
EMF Diff/Merge

Vision

- Merging = **primitive, consistency-preserving operation** for model manipulation, transformation, evolution

- Operates on arbitrary **model scopes** whose behavior can be customized

http://wiki.eclipse.org/EMF_DiffMerge
Case 1: Version Control

INTEL

Version control of models with multiple SCMs based on EMF Diff/Merge* in Intel® CoFluent™ Studio
Once upon a time... a product

A modeling and simulation framework for predicting system behavior and performance before starting hardware and software design

http://cofluent.intel.com
Technologies

- Eclipse
- EMF
- GMF
- C++
- Xtext
- Gendoc
- Acceleo
Problem

How to compare models?

- Locally
- Shared using various SCMs

Needs to

- Be sexy!
- No framework labels like Edge, Node
- Ensure graphic/semantic cohesion
The solution

- Model consistency preservation
- Provides extendible API
- Easy integration
- Very responsive team on forum/bugs
What we’ve done

- **GUI integration with Eclipse Compare**
  - Compare with each other
  - Compare with local history

- **GUI integration**
  - With Git*
  - With Perforce*
  - With Subversion*

- **Logical models integration**

- **Customized UX**
  - LabelProvider/ContentProvider
  - Menus
  - Resource load/unload
Demo

Intel® CoFluent™ Studio
Wait… happy ending!

Let’s contribute

- Logical model support
- Local history support
- Git* support
- Perforce* support
- Subversion* support

Represent 60 classes & ~4000 LOC

https://www.eclipse.org/forums/index.php/t/1066288/
Case 2: Incremental model transformations

CDO-based model infrastructure with incremental import/export
Solution overview

UML Tool --> Eagle CDO Repository

transform and commit model

Design Tools

checkout (part of) the model
and transform

do some design

transform, merge and commit

UML Tool --> Eagle CDO Repository

www.websequence-diagrams.com
Tool transformation and import

- Tool model
- Eagle model v1
- Eagle target branch
  - Model transformation (ATL, Java)
  - Eagle model
  - Model comparison
    - Compute list of differences
    - Differences
      - Filter differences according to some tool/business oriented logic
      - Differences
        - Differences to apply
          - Conflict detection
  - Differences displayed in Preview
    - Apply differences
      - Result model
        - Eagle model v2 draft
  - Eagle model v2
    - Commit
      - Eagle target branch
        - Eagle model v1
          - Eagle model v2
Merge between branches

Eagle source branch

Eagle model

Eagle model (subset)

source

Eagle target branch

Eagle model v1

Eagle model (subset)

Dataset computation

source

Model comparison

Differences

Compute list of differences

Differences to apply

Conflict detection

Apply differences

Eagle source branch

Eagle target branch

Eagle model v2

Eagle model v1

Differences displayed in Preview

Eagle model v2 draft

Result model

Commit

Eagle target branch

Eagle model v2

Eagle model v2

Eagle model v1
CDO & Diff/Merge integration

Diff/Merge customization

- Match policy (ID-based)
- Merge policy

3-way merge using the ancestor pulled from the CDO history
Happy ending… again

Let’s contribute!

- Tracking of model scope for merge actions
- Higher-level 3-way conflict detection
Case 3: Modeling Patterns

THALES

Modeling Pattern tool for Sirius-based environments
Modeling Patterns

- Pattern [engineering]: a solution to a recurring problem

- "Modeling pattern": a modeling principle that reflects a pattern
  - Data
  - Constraints
  - Graphical representations
A dedicated tool?

Usage of the tool
- Extract a pattern from a model
- Store it in a catalog
- Reuse it in other models [with roles]
- Evolve patterns and models, check conformance/synchronize when needed

It is rather fun because
- All is done though dialogs, no programming
- Diagramming concerns are handled via Sirius

http://wiki.eclipse.org/EMF_DiffMerge/Patterns

thanks to
Demo
Looking into the future …

« EMF Convergence »?
The end "o/

TIME FOR QUESTIONS
(UNLESS WE REALLY TALKED TOO MUCH)