The ATLAS Model Weaver (AMW) project

ATLAS Team
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GMT/AMW project web site: http://www.eclipse.org/gmt/amw/
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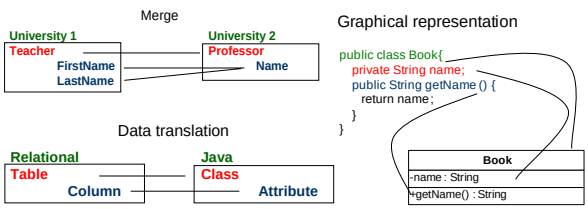
Model Weaving

Today there are many types of models used to represent a great number of systems. These models are not isolated, but may be woven in different ways. Models are woven by establishing different kinds of links that contains the semantics of weaving. As examples we cite merge operations, traceability links, data translation mappings, text to graphical representation, etc.



Creating a weaving model

A weaving model (conforming to a weaving metamodel) is created to capture different types of links. A weaving model is usually created in a semi-automatic process divided into an automatic and a manual phase. In model management this process is called *matching*.

Automatic

We combine different matching heuristics to calculate the similarities between elements of different models or metamodels.
This process returns a similarity value between model elements.

String similarity
OpSys ⟷ OperatingSystem
Descr ⟷ Description

Dictionaries of Synonyms
Car ⟷ Automobile
Professor ⟷ Teacher

Structural features
Bug — Severity ⟷ Issue — Severity
If *Severity* matches, *Bug* and *Issue* also match.

Manual

When the automatic match does not find the correct relationships, human intervention is required.
This is usually the case of complex kinds of links that involve arithmetic expressions.

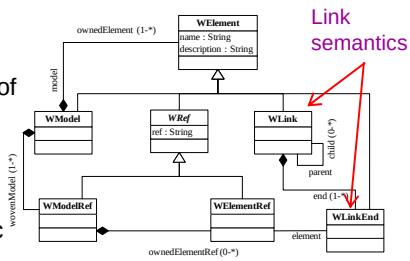
Format compatibility
Date = Day / Month / Year

Concatenation
Name = FirstName + LastName

Data conversions
Dollar = Euro x ConvertionRate

Generic link management

Most part of weaving applications are based on the notion of typed links between model elements.
We propose a core weaving metamodel that supports generic link management.



The *WLink* element defines a link between 1 or more elements (reference to *WLinkEnd*).

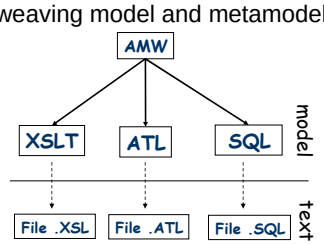
Data integration

Weavings as specifications of model management operators

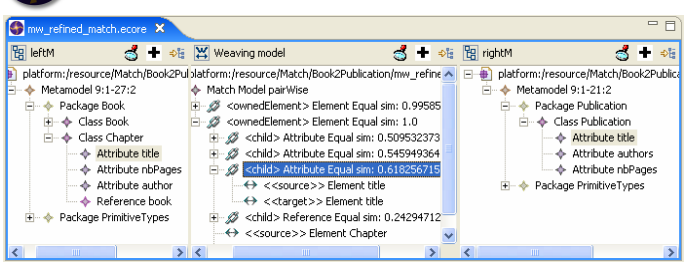
A weaving model may be used as a specification to automatically produce model transformations.
The different link types are declarative specifications of frequently executed meta data tasks. The weaving model as a whole is an specification of model management operations for data integration.

The independency of the weaving model and metamodel allows producing different transformations models.

The transformation model are translated into their standard textual format.



The prototype



Conclusions

Weaving models capture different types of weaving links.
A weaving model used together with model transformations languages allows creating executable operations to be used in different applications scenarios.

Team:
http://www.sciences.univ-nantes.fr/lina/ATLAS/
http://www.sciences.univ-nantes.fr/lina/atl/

Other Tools:
http://www.eclipse.org/gmt/atl/
http://www.eclipse.org/gmt/am3/