



Eclipse and Rational Modeling Tools



Overview

- In this module we explore the eclipse modeling tools in more detail
- Look at the different projects and how they relate

Goals

- After this module you will
 - Have an understanding of Eclipse modeling projects
 - How they extend each-other
 - How they can be transformed into models and text
 - You will also have a roadmap for the rest of the training

Agenda

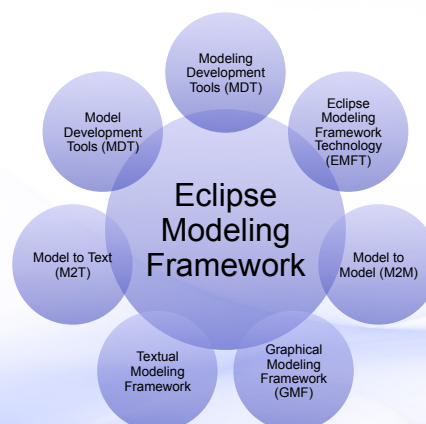
- Modeling in Eclipse
 - EMF, GMF, TMF, TCS
- Tooling in Eclipse
 - MDT, EMFT,
- Transformations
 - M2M, M2T

Eclipse Modeling Project

- Model-based development technologies
 - Frameworks
 - Tooling
 - Implementations of standards



Ecosystem of the Modeling Project



Eclipse Modeling Framework (EMF)

- Framework and generation for metamodels
- Sub-projects
 - CDO - distributed shared EMF models and server based O/R mapping
 - Model Query - specification and execution of queries against and EMF model
 - Model Transaction - model management layer
 - Net4j - extensible client-server system using Eclipse Runtime and Spring Framework
 - SDO - EMF implementation of service data objects, data application development in a SOA architecture
 - Teneo - database persistency for EMF models
 - Validation Framework - model integrity



Graphical Modeling Framework (GMF)

- Runtime and tooling for developing a graphical concrete syntax
- Built on-top of EMF and GEF
- Feature rich graphical model editors

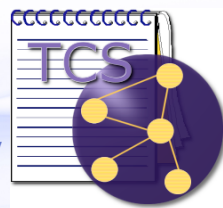


Textual Modeling Framework (TMF)

- Runtime and tooling for developing textual concrete syntax
- Generation of editors and other tooling from a grammar
- Sub-projects
 - TCS
 - xtext

TMF - TCS

- TCS - Textual Concrete Syntax
- Built on top of EMF
- Non-standards based language for annotating an abstract syntax model with textual syntax
- Able to generate
 - Grammar
 - Editor
 - Model to text transformation with traceability



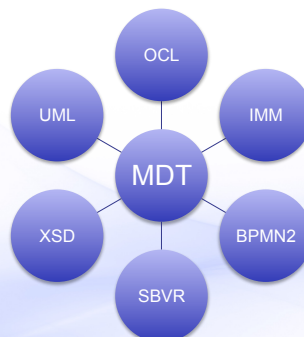
TMF - xtext

- Developed as part of the openArchitectureWare
- Built on-top of EMF and ANTLr
- From proprietary grammar language
 - Generate editor - syntax highlighting and code completion
 - Generate EMF abstract syntax model
 - Generate integration with generation framework
 - Generate integration with semantic validation framework



Model Development Tools (MDT)

- Project that focuses on industry stand models





Eclipse Modeling Framework Technology (EMFT)

- A proving ground for EMF projects
 - Research projects
 - Incubation projects
- When a project matures it is moved or promoted
 - To another modeling sub-project
 - To its own sub-project
- Examples
 - EMF runtime for the .NET platform
 - Tools for building Ecore models



Model to Model (M2M)

- Project that focuses on technologies for model to model transformation
- Work with EMF based as well as other input models
- Sub-projects include
 - QVT
 - ATL

M2M - QVT

- Implementation of OMG's Query/View/Transformation specification
- Three languages for performing M2M transformation
 - Operational - currently supported
 - Relational - in development
 - Core - planned
- QVT editor, debugger and interpreter

M2M - ATL

- ATL - ATLAS Transformation Language
- Developed by ATLAS group at INRIA & LINA
- Proprietary M2M language
 - Similar to the QVT operational language
- ATL editor, debugger and virtual machine

Model to Text (M2T)

- Project that focuses on technologies for model to text transformation
- Work with EMF based as well as other input models
- Sub-projects
 - JET
 - xPand

M2T- JET

- JET - Java Emitter Templates
- Template based language with an JSP like syntax
- Editor for developing templates/transformations
- Execution engine for executing transformation
- Used by EMF to generate code

M2T - xPand

- Developed as part of the openArchitectureWare
 - Maturing into an Eclipse project
- Template based language with a non-standards based syntax
- Editor for developing templates/transformations
- Execution engine for interpreting templates
- An extended version is used by GMF to generate code

Summary

- The projects are nicely layered
- Good effort to keep things separated
- Ability for users to pick and choose what they want
- Lots of content to go through this week

Questions

