Model-Driven Engineering Tools
Epsilon-Eugenia/Emfatic

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Eclipse Epsilon

• Family of languages and tools in Java (Eclipse),
• Goal: Automating MDE
• Core:
  – EOL (Epsilon Object Language)
  – OCL for Model Querying
• On top of EOL, Epsilon provides languages for:
  – model validation
  – model-to-model transformation
  – code generation,
  – …

https://www.eclipse.org/epsilon/doc/
Eclipse Epsilon

• Epsilon relies on a **model connectivity layer**
  – shields it from any specific modeling technology (such as EMF)
  – It query and modify models that conform to different technologies in a uniform way
    ▪ e.g. EMF, Simulink, XML, CSV, …
Epsilon Architecture
Graphical Modelling Tools in Epsilon - Picto

**• Picto: light weight visualization**
  - It visualizes instance models via model-to-text transformation to SVG/HTML/JS
  - It does NOT provide graphical modelling editor (unlike GMF, Sirius, Eugenia, …)
    - It produces read-only views from models
  - The model visualization can take place in any browser
    - So, it does not require running (multiple) Eclipse instances
Graphical Modelling Tools in Epsilon - Eugenia

• Eugenia heavy weight modelling editor
  – Eugenia is a front-end for Eclipse GMF
    ▪ Visual/graphical syntax-directed editors in the ECore
  – It generates a fully-functional GMF editor (applying MDE on MDE tools 😊)
    ▪ by specifying a few high-level annotations in the Ecore metamodel
    ▪ In other words: the abstract and concrete syntaxes are specified in a single MM document
  – It can be useful for quickly generating PoC for a graphical modelling editor
  – For implementation:
    ▪ You can use a regular EMF editor and add your annotations to the metamodel to specify concrete syntax (CS)
    ▪ You can use Emfatic language to specify metamodel and CS annotations
      o A textual language and editor developed in Xtext

https://www.eclipse.org/epsilon/doc/eugenia/
Eugenia and Emfatic

- It automatically generates all models required by GMF from a single annotated Ecore metamodel in Emfatic:
  - .gmfgraph,
  - .gmftool and
  - .gmfmap
Eugenia

**Example: File System**
- From this annotated EMF metamodel (expressed in Emfatic)
- it can generate a fully functional GMF editor (shown in the next slide)
Eugenia polishing:
To further customize the editor you need to customize the generated .gmfgraph, .gmfmap and .gmftool models.

The rules for warnings, errors, auto-corrections are added using EVL.
Live Demo

- PACo Project: Product-Assembly Co-Design
- Product Assembly Sequence Modelling
Questions?