

# b + m engineering

## GenGMF

Efficient editor development for large meta models  
using the Graphical Modelling Framework

**Enrico Schnepel**

MDSE Workshop 2008



- **GMF – What's the problem?**
- **GenGMF – partitioning complexity!**
- **Demo**

- expert for business IT management concepts
- more than 14 years of reliable and innovative service
- expected sales in 2008: more than 20 million EUR
- 230 employees at 6 locations
- leader in automating development processes for programming customised software solutions in the German-speaking area



- **GMF models often tend to become very large**
  - 10-20 times larger than the meta model
- **„Graphical Def Model”, „Mapping Def Model”**
  - Complex cross referencing between model elements
  - error-prone editing of GMF models due to it's over-proportionally growing complexity
- **„Tooling Def Model“ has only minimal references**
  - Nearly linear growing complexity

- **Information redundancy**
  - Two similar looking diagram node types in the diagram editor have also a similar description in the GMF models
  - most of the information is stored redundant
- **Information spreading („Graphical Def Model“)**
  - Model elements belonging to the same diagram node type are spread across the model (e.g. FigureDescriptor / DiagramLabel)

# Graphical Modeling Framework (GMF)

## What's the problem?

- Do you see the five differences?

▼ ◆ Figure Descriptor SetterNodeFigure
▼ ◆ Rectangle SetterNodeFigure
◆ Background: {192,255,192}
▼ ◆ Label FixedLabelFigure
◆ Foreground: black
◆ Basic Font
◆ Insets 3
▼ ◆ Label SetterNodeLabelFigure
◆ Insets 0
◆ Child Access getFigureSetterNodeLabelFigure

▼ ◆ Figure Descriptor QueryNodeFigure
▼ ◆ Rectangle QueryNodeFigure
◆ Background: {255,192,192}
▼ ◆ Label FixedLabelFigure
◆ Foreground: black
◆ Basic Font
◆ Insets 3
▼ ◆ Label QueryNodeLabelFigure
◆ Insets 0
◆ Child Access getFigureQueryNodeLabelFigure

# Graphical Modeling Framework (GMF)

## What's the problem?

- Do you see the five differences?

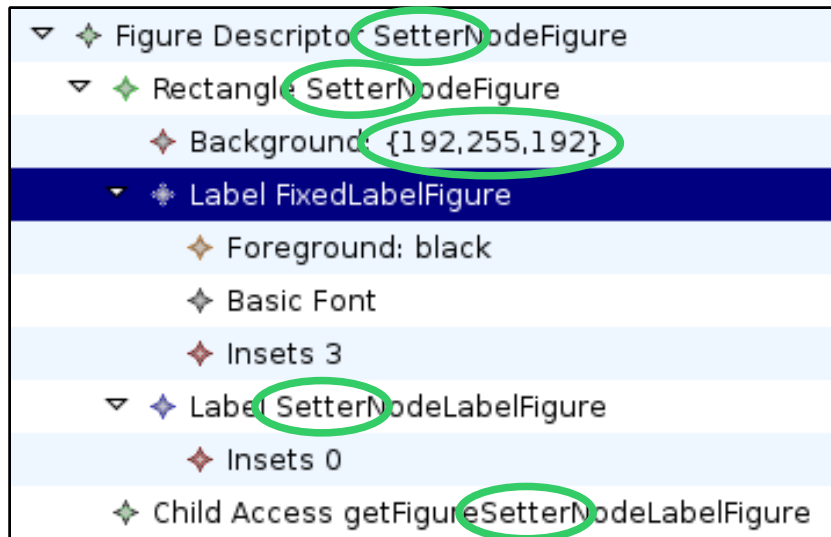


Figure Descriptor SetterNodeFigure

- Rectangle SetterNodeFigure
  - Background {192,255,192}
  - Label FixedLabelFigure
    - Foreground: black
    - Basic Font
    - Insets 3
  - Label SetterNodeLabelFigure
    - Insets 0
  - Child Access getFigure SetterNodeLabelFigure

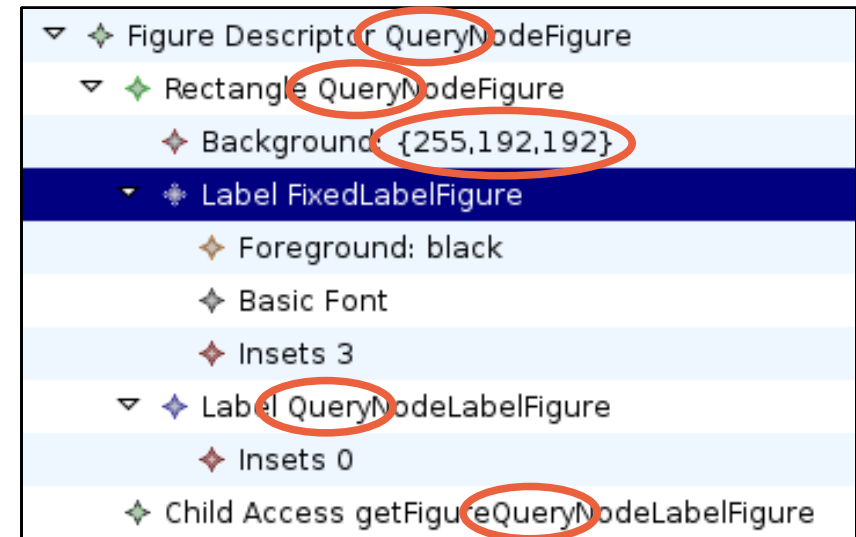
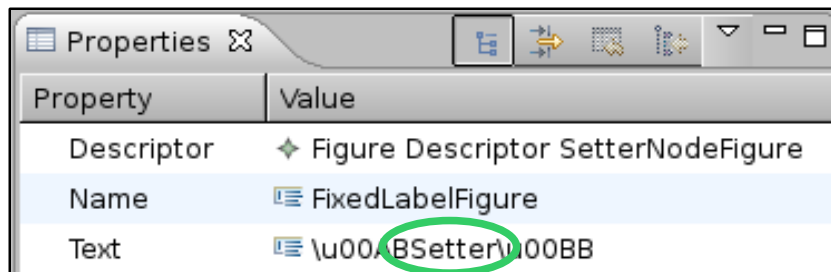
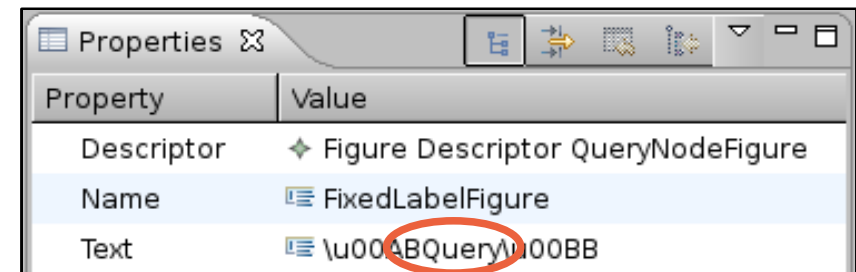


Figure Descriptor QueryNodeFigure

- Rectangle QueryNodeFigure
  - Background {255,192,192}
  - Label FixedLabelFigure
    - Foreground: black
    - Basic Font
    - Insets 3
  - Label QueryNodeLabelFigure
    - Insets 0
  - Child Access getFigure QueryNodeLabelFigure



Property	Value
Descriptor	Figure Descriptor SetterNodeFigure
Name	FixedLabelFigure
Text	\u000BSetter\u000B

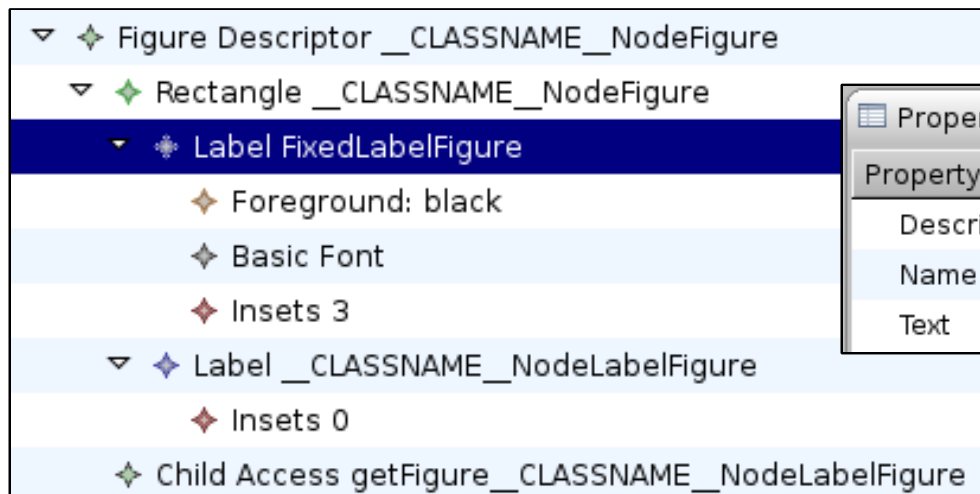


Property	Value
Descriptor	Figure Descriptor QueryNodeFigure
Name	FixedLabelFigure
Text	\u000BQuery\u000B

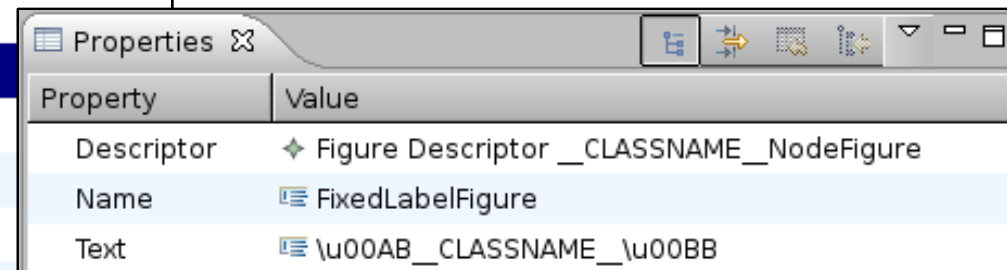
«Setter»  
↓  
A Setter Node

«Query»  
Q  
A Query Node

- **Generator for the GMF models**
  - „Graphical Def Model”
  - „Mapping Def Model”
- **Common information is stored only once**



- Figure Descriptor \_\_CLASSNAME\_\_NodeFigure
  - Rectangle \_\_CLASSNAME\_\_NodeFigure
    - Label FixedLabelFigure**
      - Foreground: black
      - Basic Font
      - Insets 3
    - Label \_\_CLASSNAME\_\_NodeLabelFigure
      - Insets 0
  - Child Access getFigure\_\_CLASSNAME\_\_NodeLabelFigure



Property	Value
Descriptor	Figure Descriptor __CLASSNAME__NodeFigure
Name	FixedLabelFigure
Text	\u00AB__CLASSNAME__\u00BB



- Describes the common layout of a set of figures
- Uses the ordinary GMF model elements for the figure description
- Every occurrence of the character sequence „\_\_CLASSNAME\_\_” in any attribute will be replaced with the name of an associated meta model class.

Figure Descriptor \_\_CLASSNAME\_\_ NodeFigure

- Rectangle \_\_CLASSNAME\_\_ NodeFigure
  - Label FixedLabelFigure
    - Foreground: black
    - Basic Font
    - Insets 3
  - Label \_\_CLASSNAME\_\_ NodeLabelFigure
    - Insets 0
- Child Access getFigure \_\_CLASSNAME\_\_ NodeLabelFigure

Property	Value
Descriptor	Figure Descriptor __CLASSNAME__ NodeFigure
Name	FixedLabelFigure
Text	\u00AB __CLASSNAME__ \u00BB

- **Association between**
  - Template
  - EClass (from the domain meta model)
  - CreationTool (from a GMF „Tooling Def Model“)
- **Label attribute mapping**
  - Like in the GMF „Mapping Def Model“
- **Additional child elements**
  - Referencing other descriptors

- **Intercepting the model element creation during model tree creation**
- New model element type must be assignment compatible to the containment reference
- Modify node appearance (e.g. Rectangle => RoundedRectangle)
- **Post processing**
  - Change attributes
  - Add new or delete child elements
  - e.g. setting the background color of a node

- **Wizards are used to**
  - Create Templates
  - Perform common task like adding a label or compartment rectangle
  - Create descriptors
- **Fast learning curve**
  - Demo - an editor in five minutes

- **Update to newest dependencies**
  - Eclipse 3.4, GMF 2.1, oAW 4.3
- **Improve Editor Support**
  - More Wizards
  - Improved script interface (depends on oAW 5.0)
- **Integration into Eclipse Modelling as a project of its own or in the GMF**
- <http://gengmf.randomice.net/>

**Thank you for Listening!**

**Questions?**

Enrico Schnepel  
Software architect

b+m Informatik GmbH Berlin

Fon +49 30 288 788 1-32

Fax +49 30 288 788 1-11

[e.schnepel@bmiag.de](mailto:e.schnepel@bmiag.de)  
[www.engineering.bmiag.de](http://www.engineering.bmiag.de)