

Generating Domain-Specific Model Editors with Complex Editing Commands

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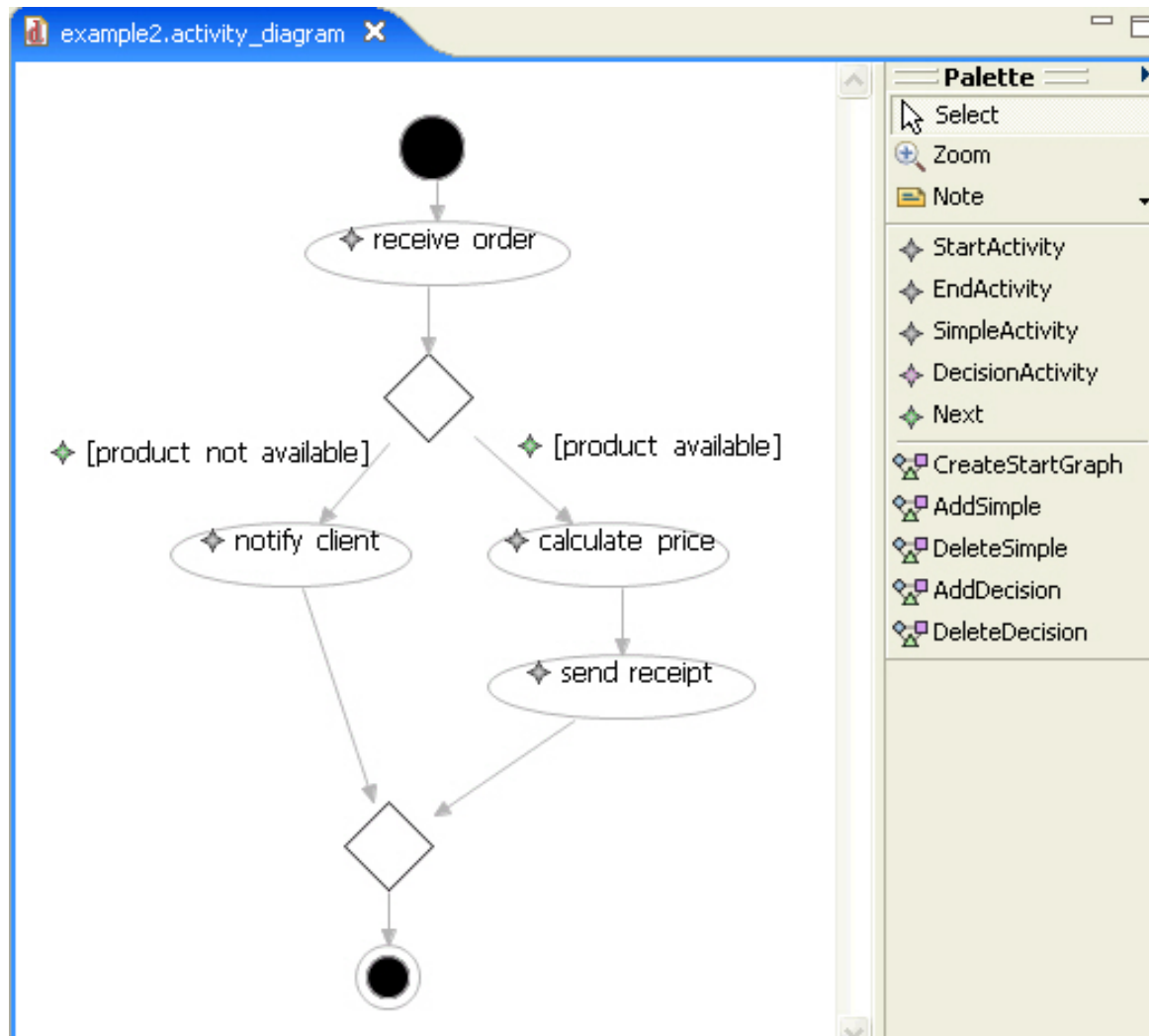
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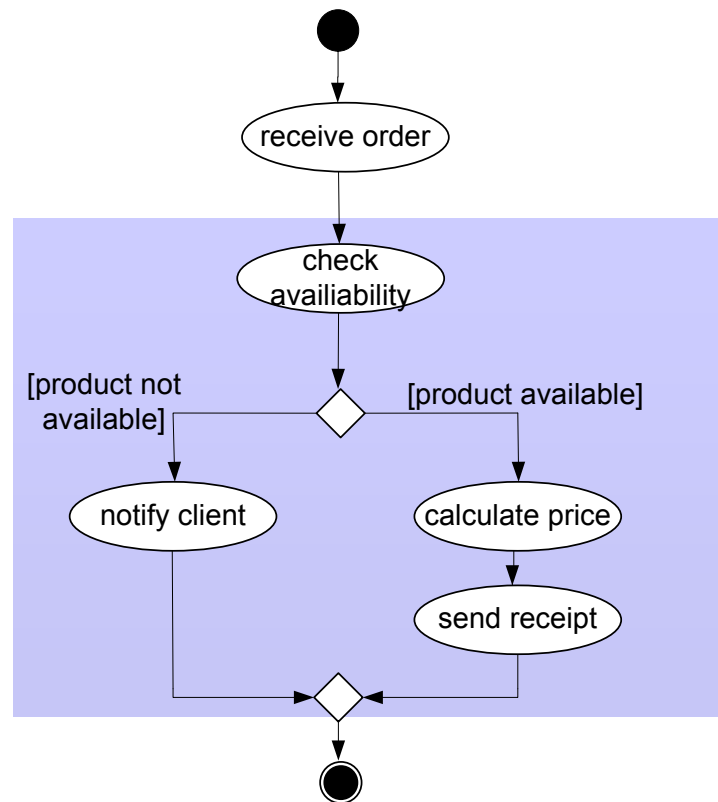
GMF editor with complex editor commands



Graphical Modeling Framework (GMF)

- designer and generator for graphical editors
 - one of the Eclipse Modeling Projects
 - based on Eclipse plug-ins
 - *EMF (Eclipse Modeling Framework) and*
 - *GEF (Graphical Editor Framework)*
 - resulting GMF-editors are also Eclipse plug-ins
- GMF concepts:
- separation of abstract and concrete syntax,
 - *in editor design*
 - *in generated editor*
 - separation of domain and diagram model
 - model for user interface (tooling)
 - editor generator for graph-like diagrams

Example: simple activity diagrams



Model elements:

- activities of different kinds:
 - *start activities*
 - *simple activities*
 - *decisions*
 - *end activities*
- control flow described by arcs
 - *could have annotated conditions*

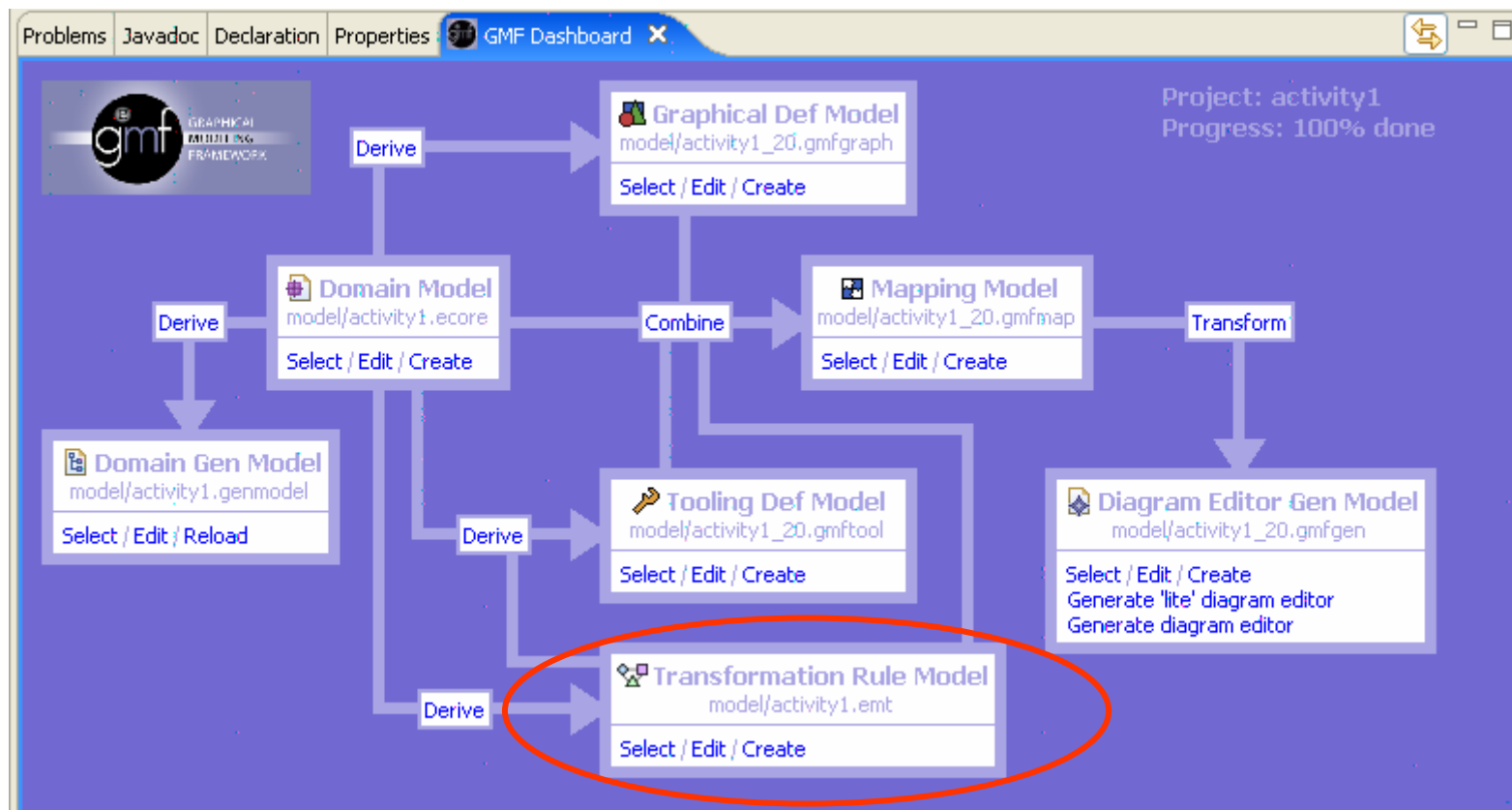
Constraints:

- one start activity only
- well-defined decision structures

Which kind of editing is supported by GMF?

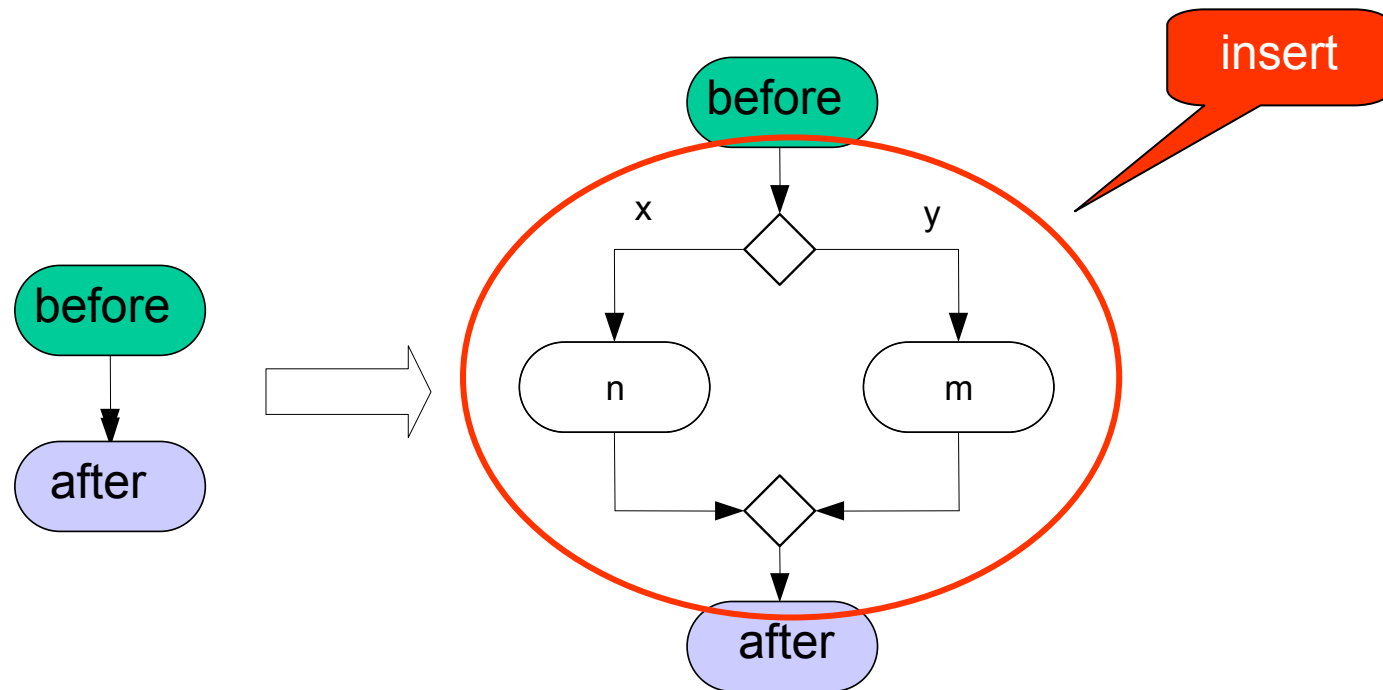
- GMF supports basic editing of graph-like structures.
 - *placing of node-like diagram elements in the panel*
 - *linking of nodes by line-like elements*
 - *checking of OCL constraints*
- Drawing complex diagrams means a lot of clicks.
- Incorrect diagrams may be possible.

Erweitertes GMF-Dashboard



Example for complex editor operation

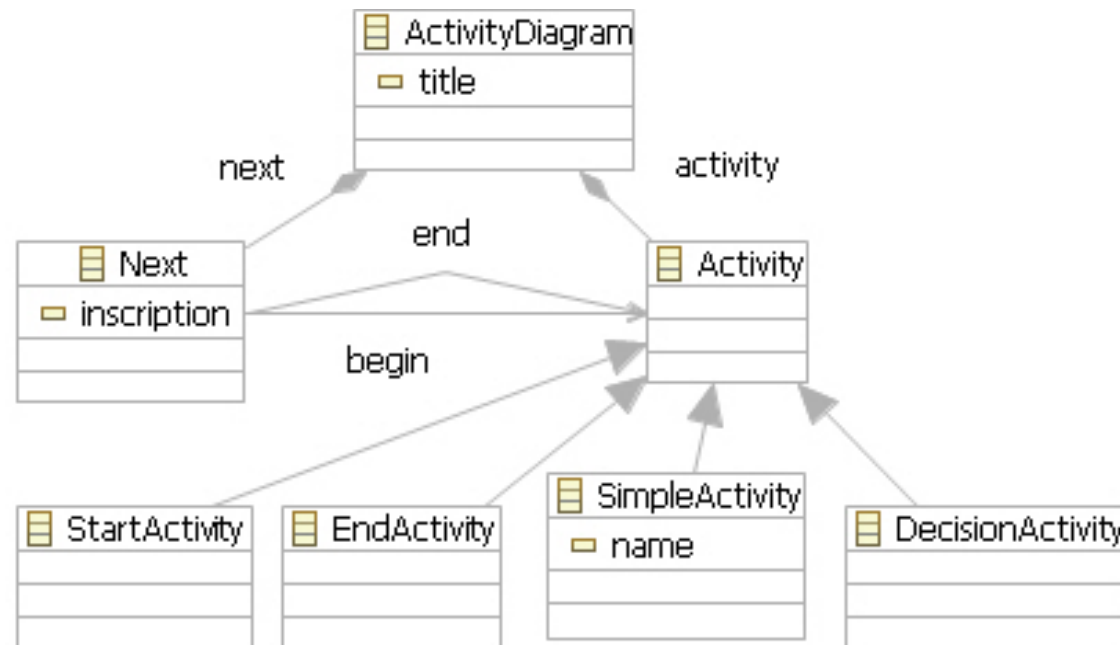
replace a simple activity by a decision structure



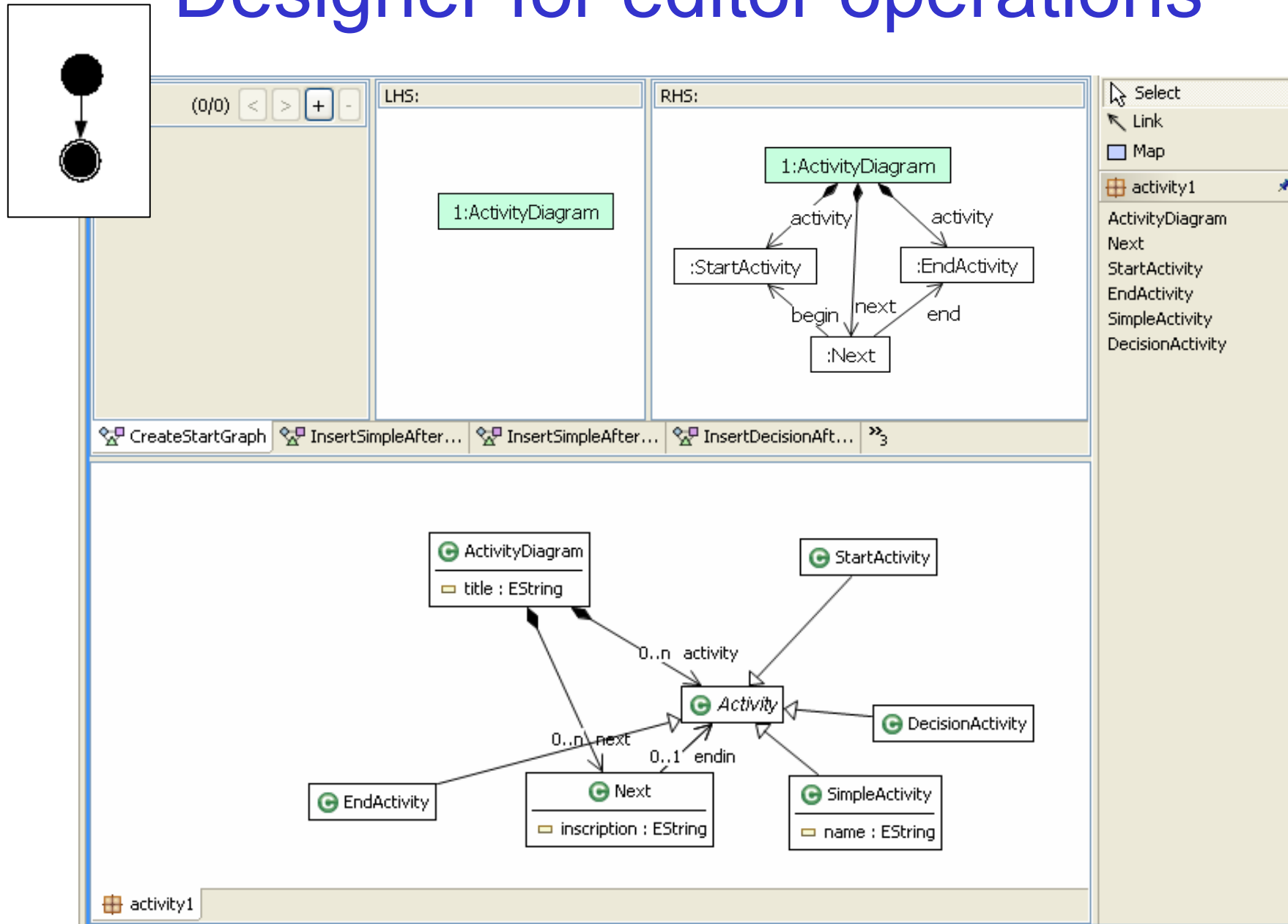
provide n, m, x, and y

Example: domain model

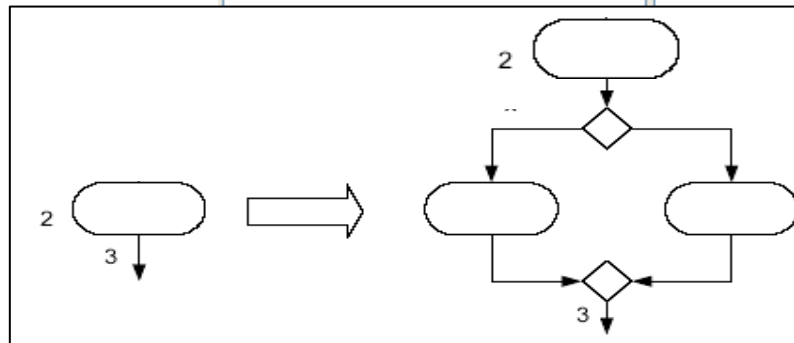
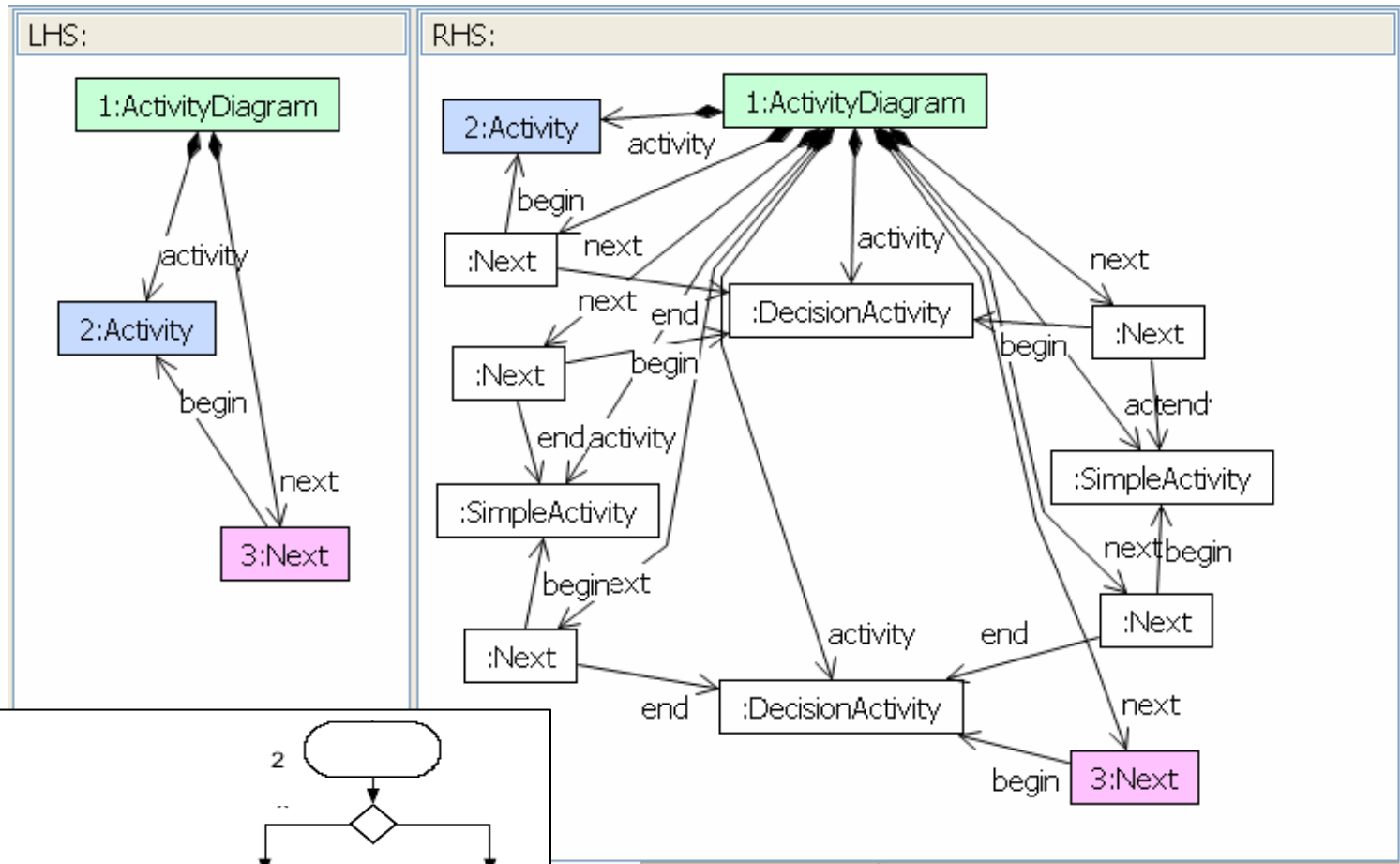
Domain model for activity diagrams



Designer for editor operations

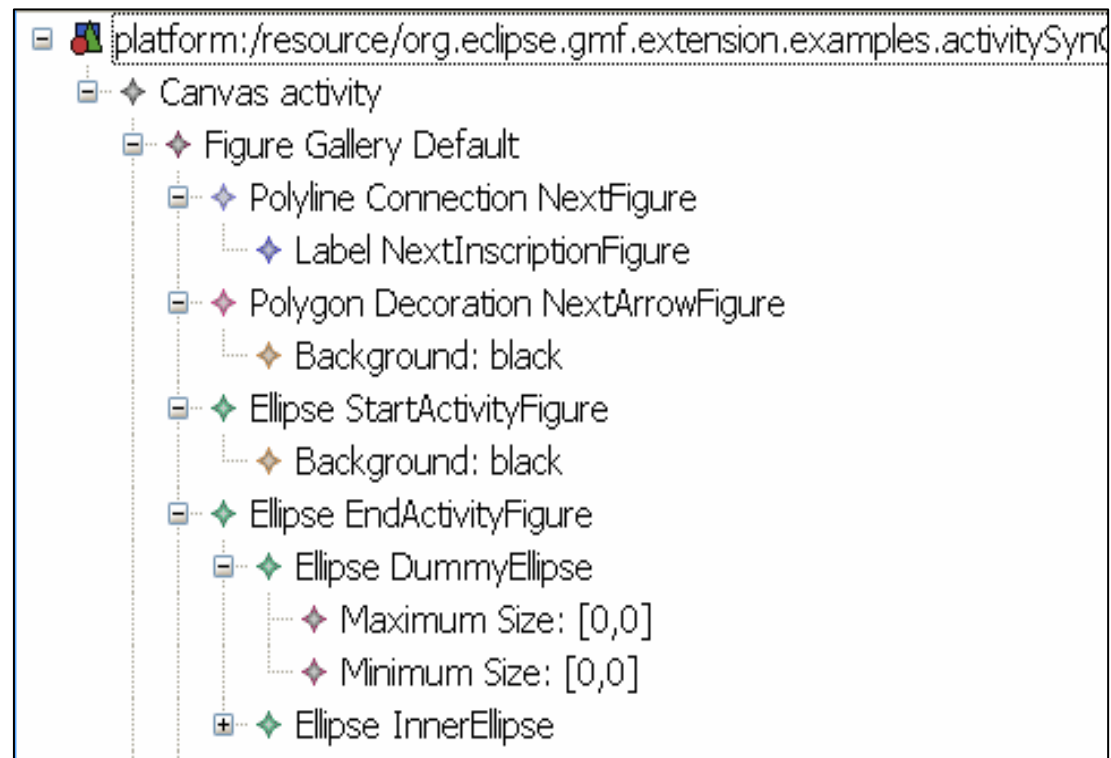


Command: InsertDecision



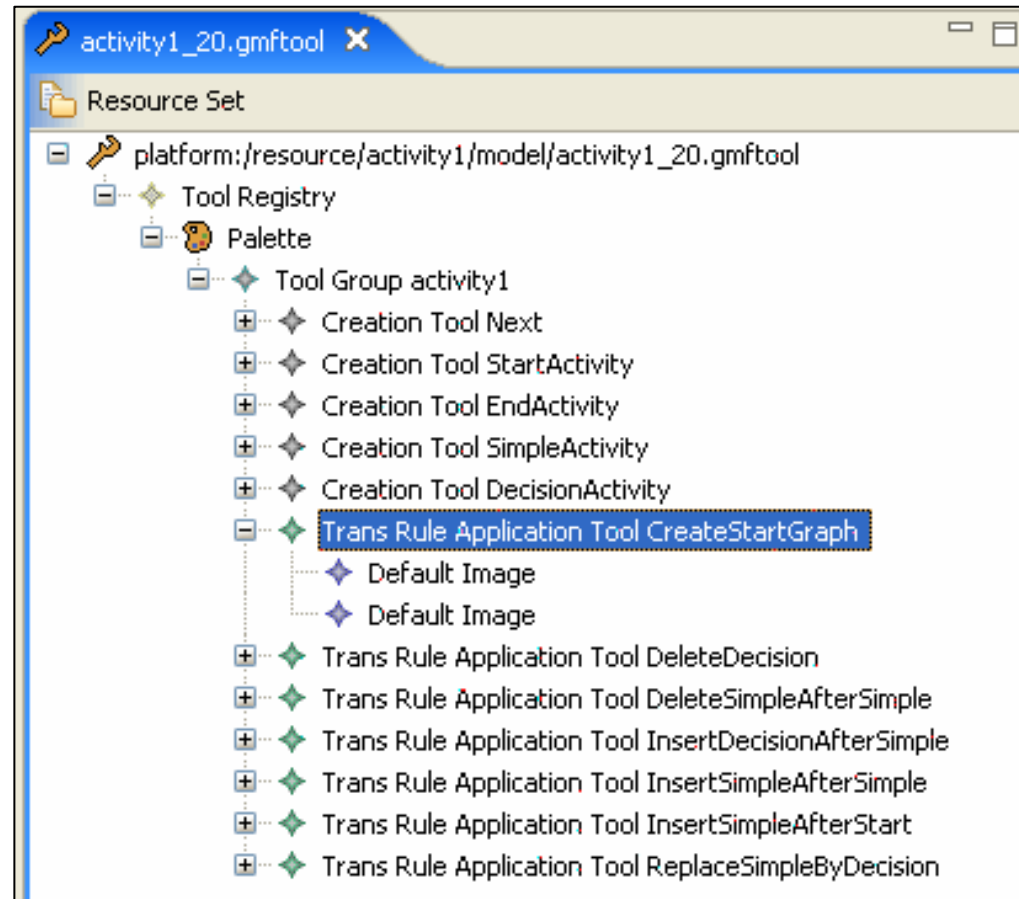
Example: diagram model

Diagram model for activity diagrams



Tooling model with extension

- additional entries in palette
- for each new editor operation a new entry



GMF mapping model with extension

- new kind of entries:
Trans Rule Mapping
- mapping of a
transformations rule on a
palette entry
- additional resource:
EMT model

platform:/resource/activity1/model/activity1_20.gmfmap

- Mapping
 - Top Node Reference <activity(DecisionActivity)/DecisionActivity>
 - Top Node Reference <activity(StartActivity)/StartActivity>
 - Top Node Reference <activity(SimpleActivity)/SimpleActivity>
 - Top Node Reference <activity(EndActivity)/EndActivity>
 - Link Mapping
 - Canvas Mapping
 - Trans Rule Mapping
 - Trans Rule Mapping
 - Trans Rule Mapping
 - Trans Rule Mapping
 - Trans Rule Mapping
 - Trans Rule Mapping
 - Trans Rule Mapping
 - Trans Rule Mapping
- platform:/resource/activity1/model/activity1.ecore
- platform:/resource/activity1/model/activity1_20.gmfgraph
- platform:/resource/activity1/model/activity1_20.gmftool
- platform:/resource/activity1/model/activity1.emt

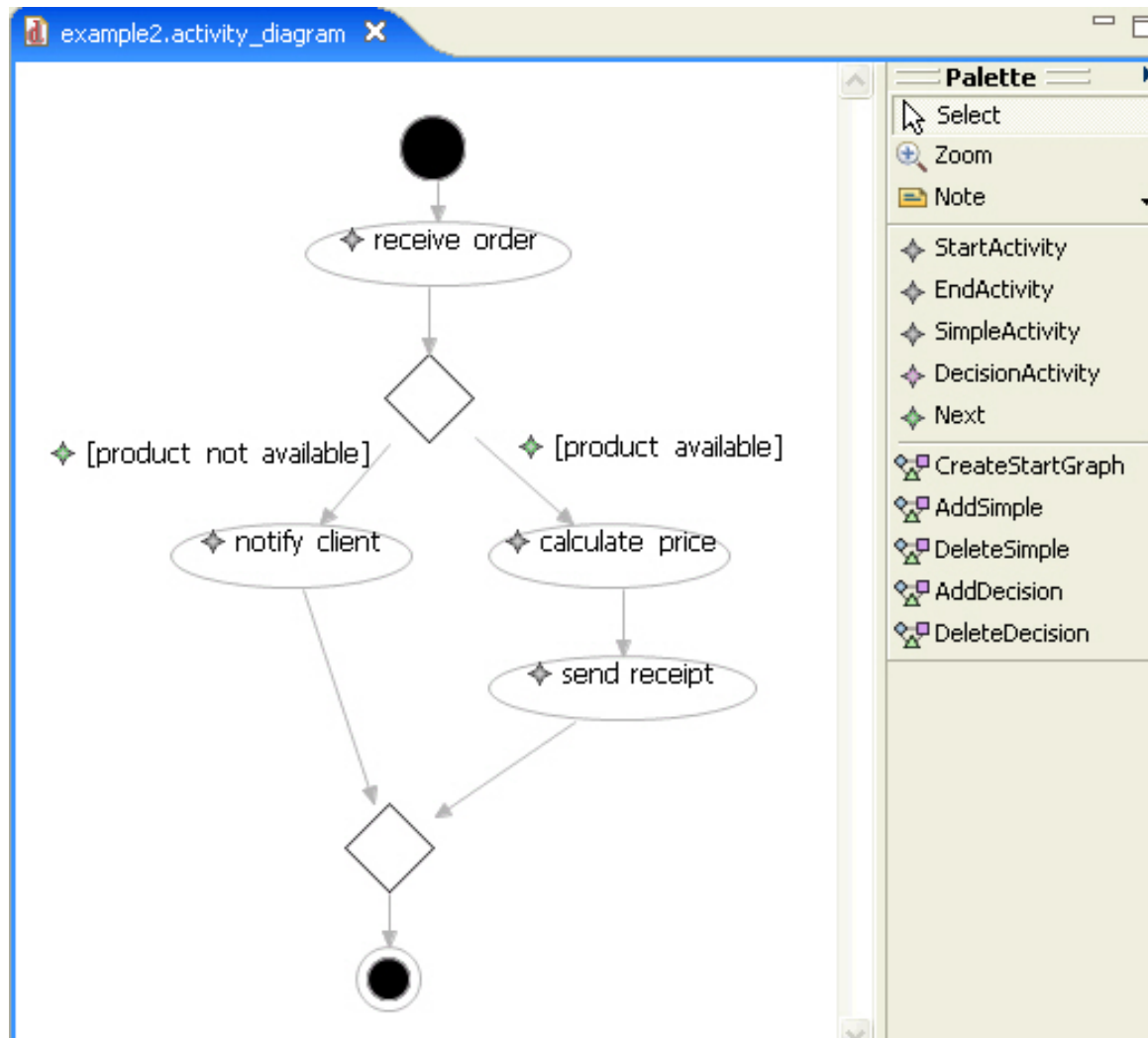
Selection Parent List Tree Table Tree with Columns

Problems Javadoc Declaration Properties GMF Dashboard

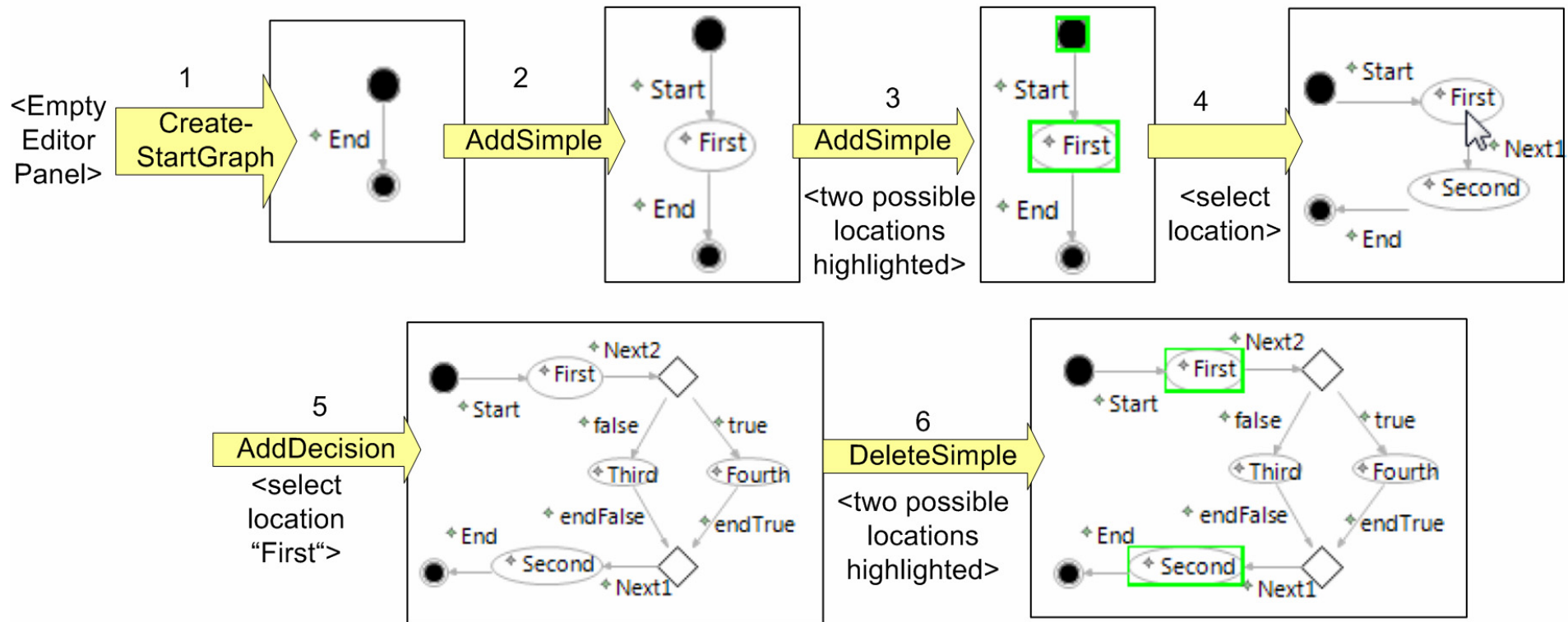
Property	Value
Misc	
Trans Rule	Rule CreateStartGraph
Visual representation	
Context Menu	
Tool	Trans Rule Application Tool CreateStartGraph

Building visual ed

Generated editor



Application of complex editor commands



Conclusion

- Complex editing commands for GMF editors
 - *based on graph transformation concepts*
- GMF Extension
 - *allows editing of several diagram elements in one step*
 - *supports command definition by EMF transformation rules on the domain model*
- Rule-based transformations can also be used for
 - *simulation of models*
 - *restructuring (refactoring) of models*

Free download of this GMF extension from:

<http://tfs.cs.tu-berlin.de/emftrans/gmftrans>