

Software Engineering

Model Driven Engineering in Fujaba

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Last Lecture: UML

- usecase diagrams
 - object diagrams
 - class diagrams
 - (activity diagrams)
-
- Announcement: <http://www.fujaba.de/>
 - allows MDE



Fujaba - <http://www.fujaba.de>

- From UML to Java And Back Again
- Fujaba is an “easy to extend UML Story Driven Modelling and Graph Transformation platform with the ability to add plug-ins.”
 - it “combines UML class diagrams and UML behaviour diagrams (Story Diagrams) to a powerful, easy to use, yet formal system design and specification language.”
 - it “supports the generation of Java sourcecode out of the whole design which results in an executable prototype.”



Fujaba

- UML
- Story Driven Modeling
- Graph Transformation
- Class Diagrams <-> Story Diagrams
- java sourcecode -> executable prototype

Task: Verify Fujaba installation, run eDobs as shown



Scenario: Towers of Hanoi



http://en.wikipedia.org/wiki/Towers_of_hanoi



User Story 1 – Hanoi setup

- Pre: 4 discs, different sizes (1,2,3,4), empty table
- define three places on table (tower-places)
- put the four discs in the right order on the first place (radius 1 on top)
- Post: 4 discs, ordered on first tower-place



User Story 2 – Initial move

- Pre: 4 discs, ordered (4,3,2,1) on first tower-place
- Move disc with radius 1 to second tower-place
- Post: 3 discs (4,3,2) on first tower-place, 1 disc (radius 1) on second tower-place



Object Diagrams for Stories

- Form teams
- Draw Object-Diagrams for pre and post cases for both user stories (on paper).
- 15 minutes each
- Present

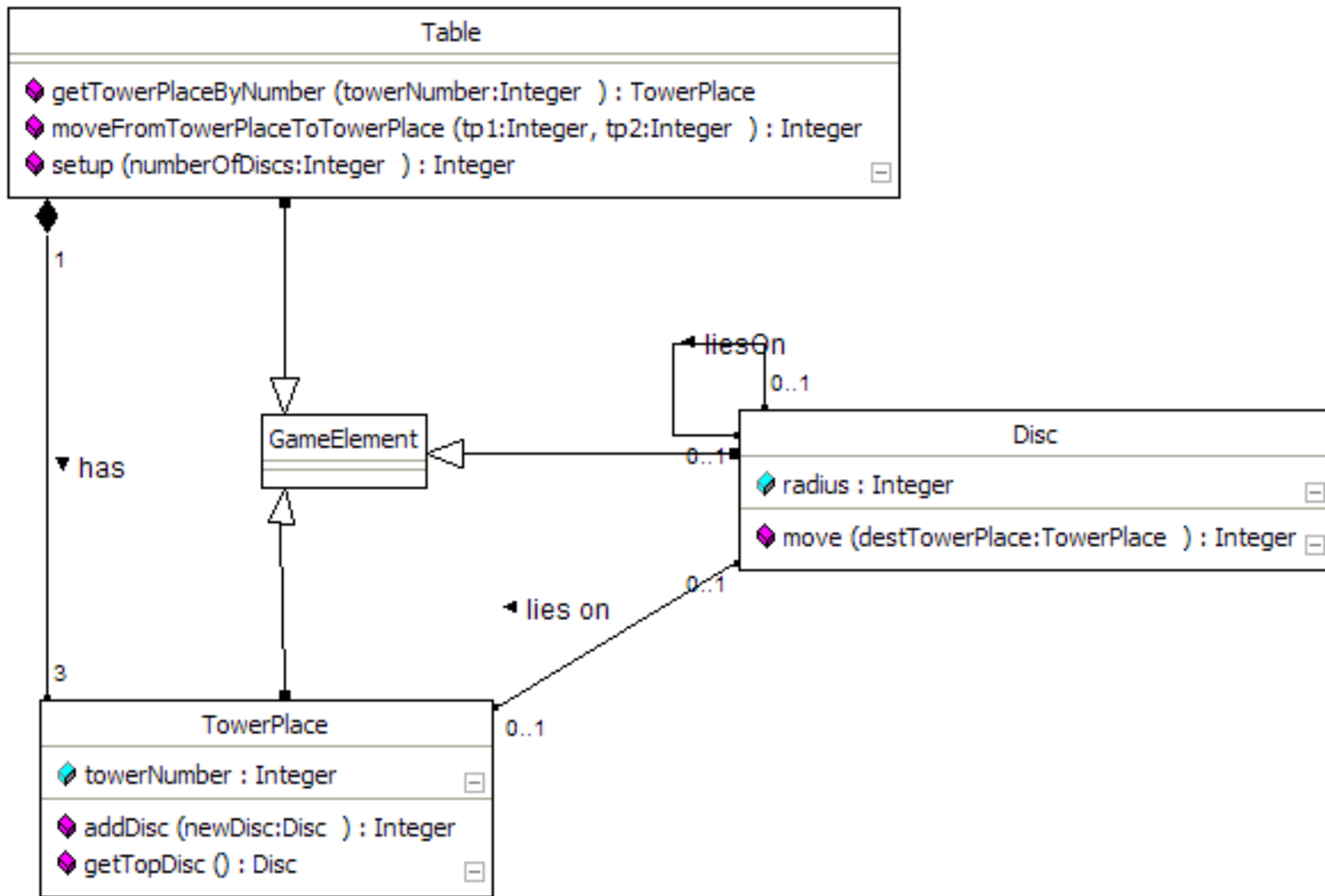


Derive the Class Diagram

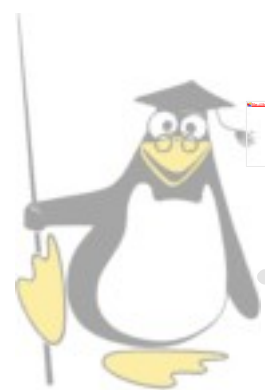
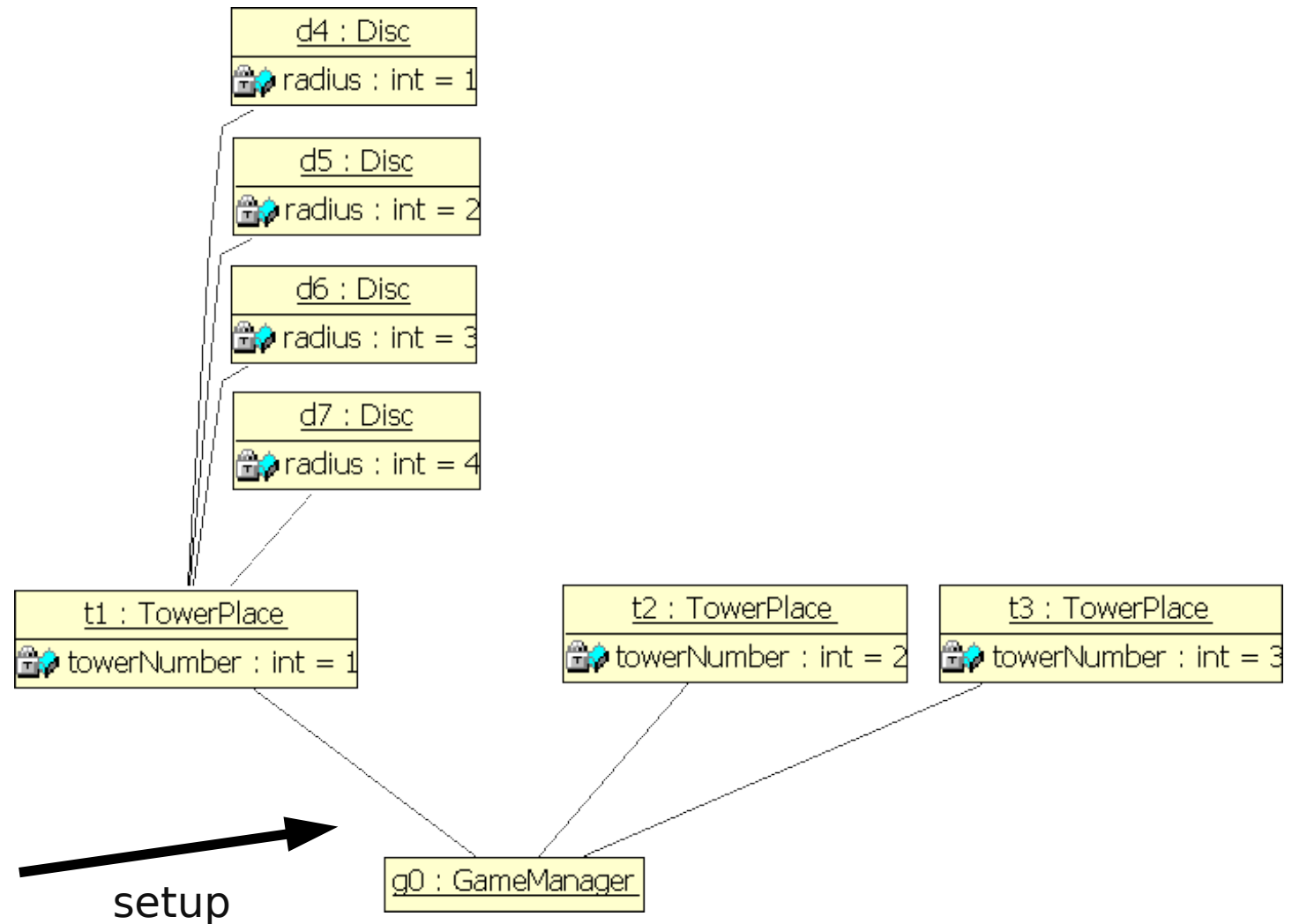
- Use Fujaba (one operator per team)
- Use classes: GameElement, Table, Disc, TowerPlace
- Methods:
 - getTowerPlaceByNumber,
 - moveFromTowerPlaceToTowerPlace,
 - setup,
 - addDisc,
 - getTopDisc,
 - move



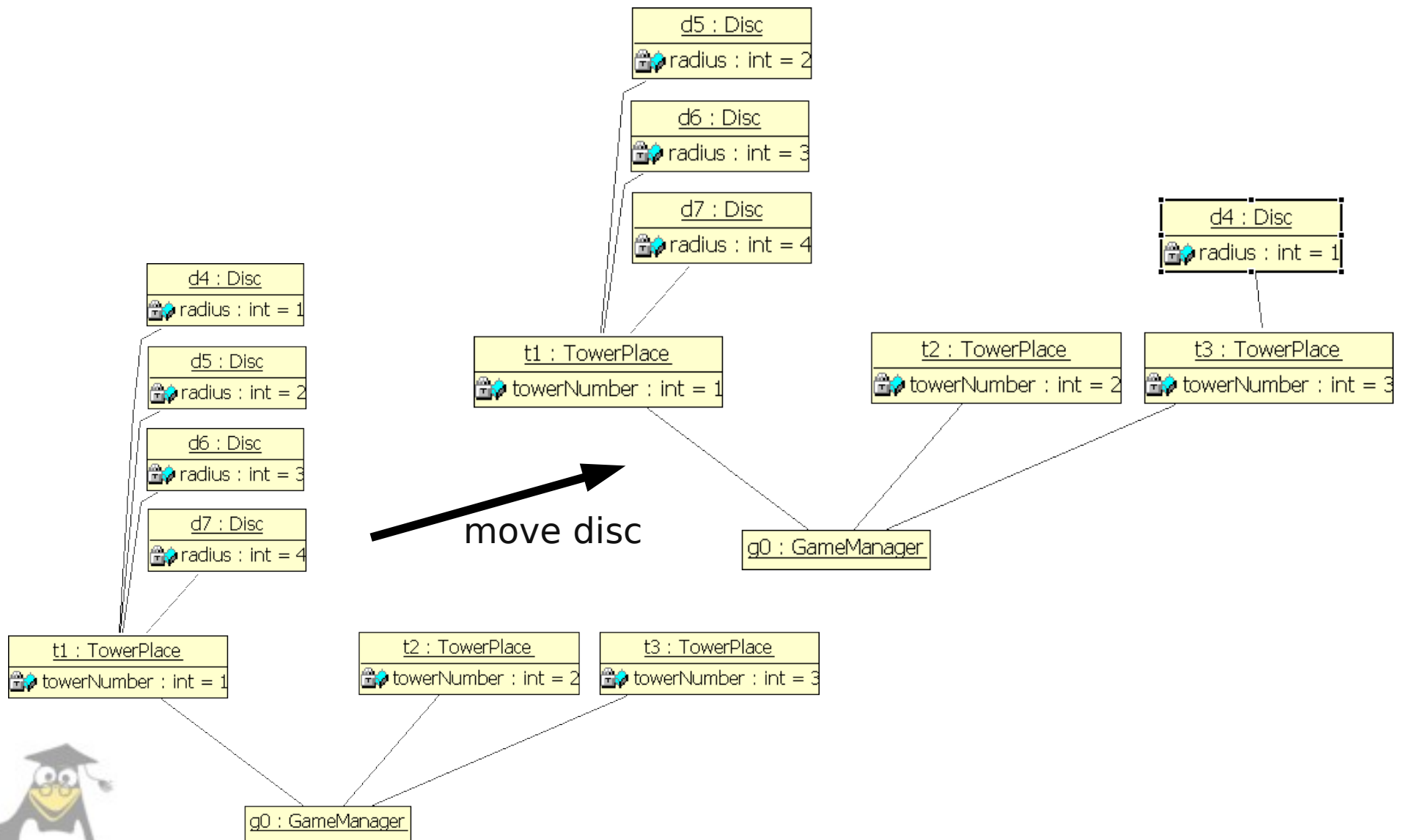
Class Diagram - Hanoi



Graph Transformation



Graph Transformation



Story Driven Modeling

- Story diagrams
- Transitions
- Matching objects
- Loops
- eDobs



Tasks

- Model the following methods and show me how you test them in the eDobs
 - getTowerPlaceByNumber,
 - getTopDisc,
 - addDisc,
 - setup,
 - move,
 - moveFromTowerPlaceToTowerPlace
- Solutions will be available in between on <http://ut.ee/~ulino/files/>



A Complex Example: eHomeConfigurator

- The class diagram: eHomeModelComplete.pdf
- A story diagram: Activity_Service_install.pdf (resulting in about 1000 lines of java-code)
- Find more at: <http://phd.ulno.net>

The screenshot displays the eHomeConfigurator v2.0 interface. The main window shows a service selection wizard with a class diagram in the background. The wizard is titled "Wizard : Service Selection" and contains instructions for selecting services. A list of services is shown with checkboxes for installation and dropdown menus for location and device selection.

Wizard : Service Selection

Please select which services you want to install in your eHome, their default strategies concerning the room selection and the strategies concerning the installation of additional devices.

Furthermore, please note that you will be able to select and deselect each room individually later on in this wizard.

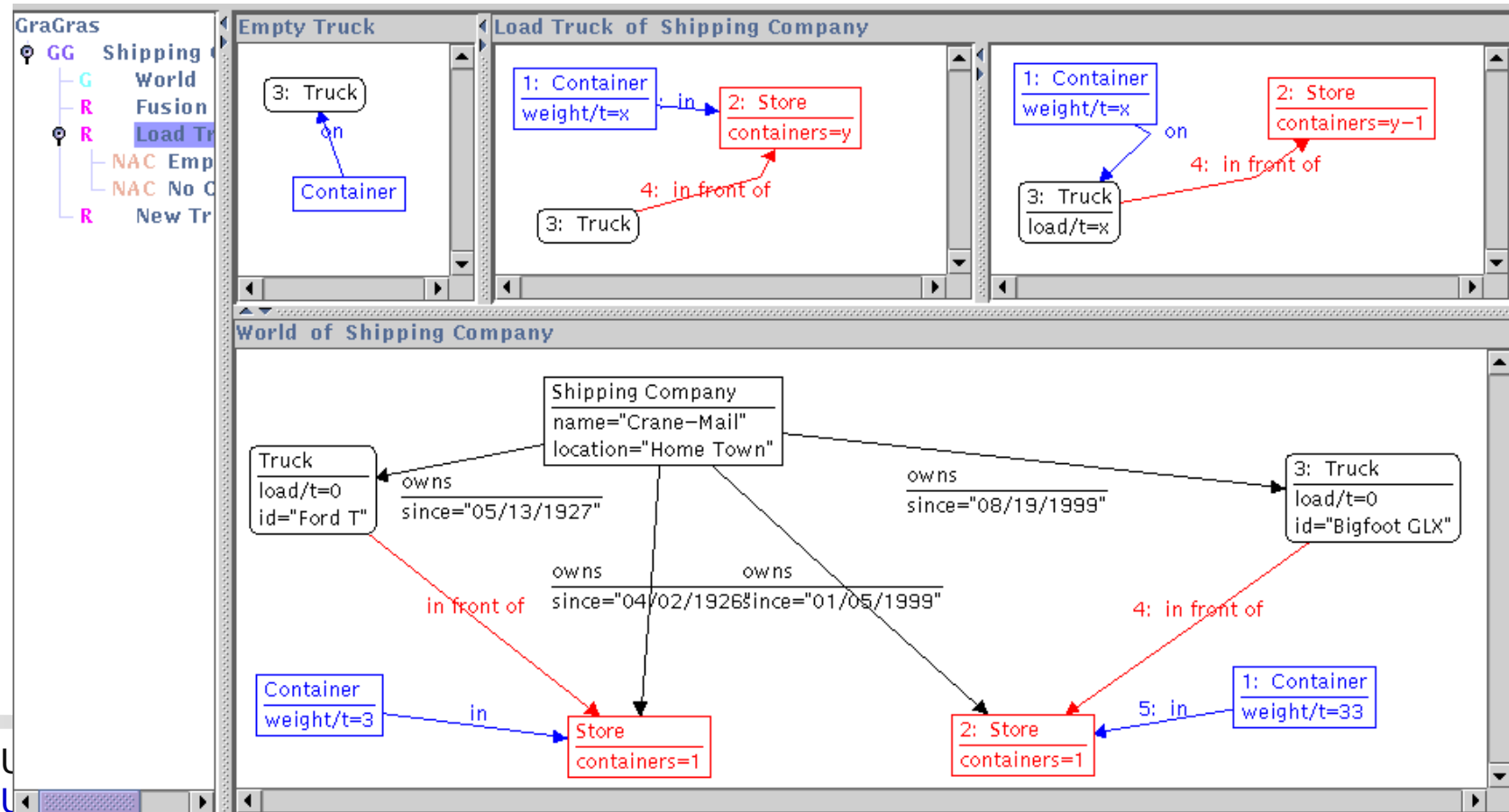
Dependent services will be installed automatically!

Lighting Service	<input checked="" type="checkbox"/> Install	Select All Locations	Necessary Devices O...
Security Service	<input checked="" type="checkbox"/> Install	Select All Locations	Necessary Devices O...
All Off Service	<input checked="" type="checkbox"/> Install	Select All Locations	Necessary Devices O...
All On Service	<input checked="" type="checkbox"/> Install	Select All Locations	Necessary Devices O...
Music Follows Person	<input checked="" type="checkbox"/> Install	Select All Locations	Necessary Devices O...
Light Motion Service	<input type="checkbox"/> Install	Select All Locations	Necessary Devices O...

Stop Next

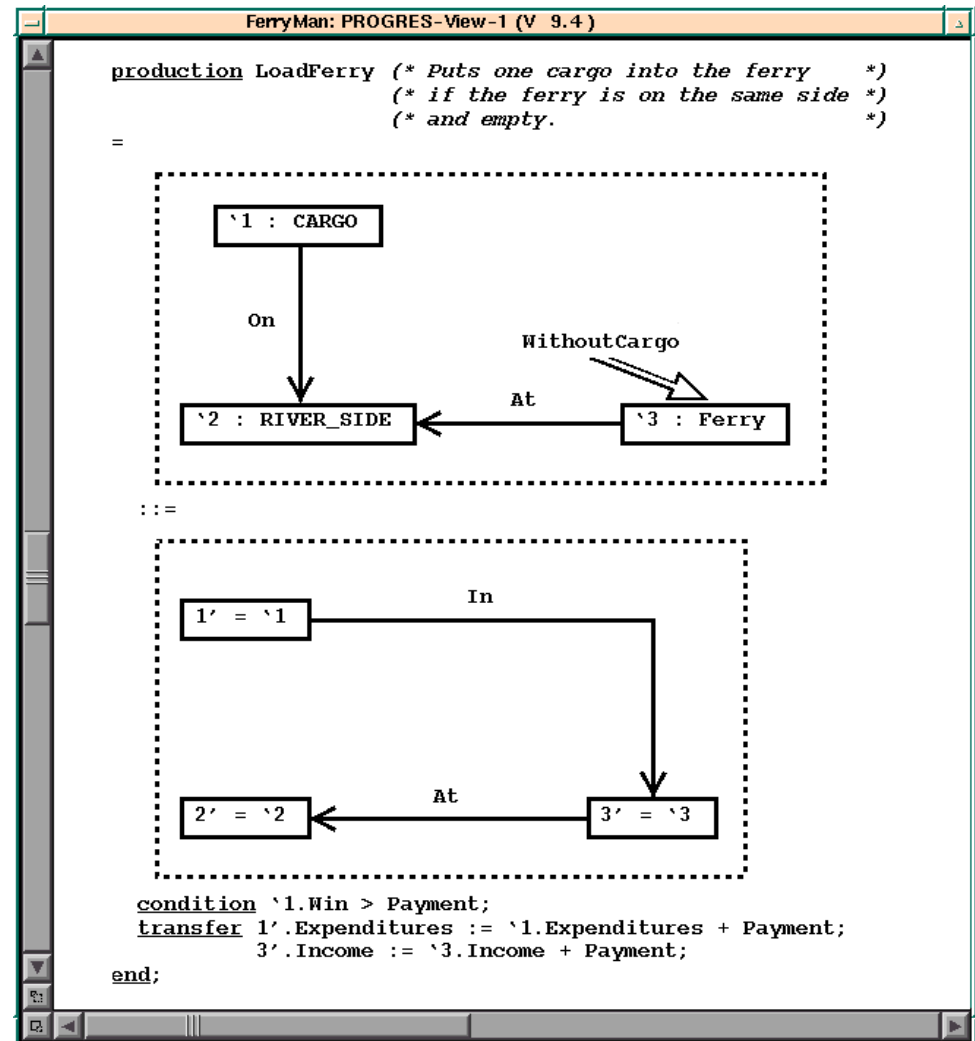
Other Graph Transformation Based Systems

- AGG:
The Attributed Graph Grammar System
<http://tfs.cs.tu-berlin.de/agg>



Other Graph Transformation Based Systems

- Progres:
An integrated environment and very high level language for PROgrammed Graph REwriting Systems



<http://www-i3.informatik.rwth-aachen.de/progres>



Lessons Learned

- Objects First Design
- Story Driven Modeling
- Visual Programming Language

