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Development of a Graphical Platform for Description of Environmental Systems Models

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Summary

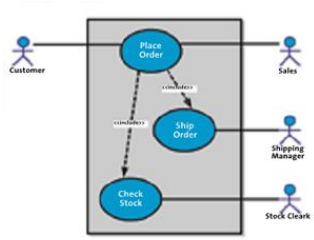
- Introduction
- TerraME
- Objectives
- Motivations
- Development of TerraME GIMS
- Final considerations

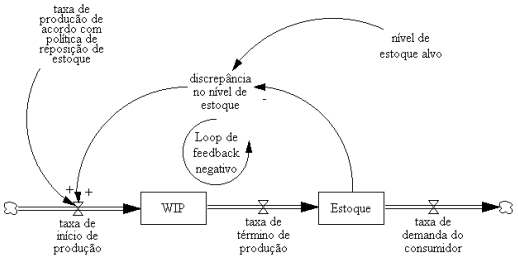
1. Introduction

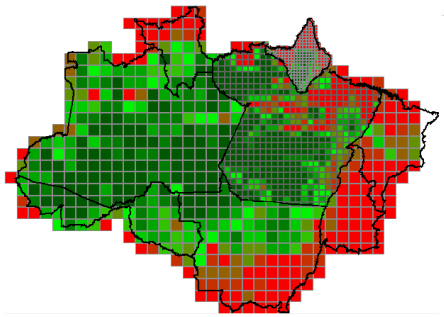
- Complex nature of problems
- Multidisciplinary teams
  - work together; communicate; collaborate
  - need: a common way to represent and change information

1. Introduction

- So, wich is the way? Models
- A model is a simplified representation of reality
- Representation
  - abstraction
  - language
- Models of environmental systems
  - Amazon deforestation model





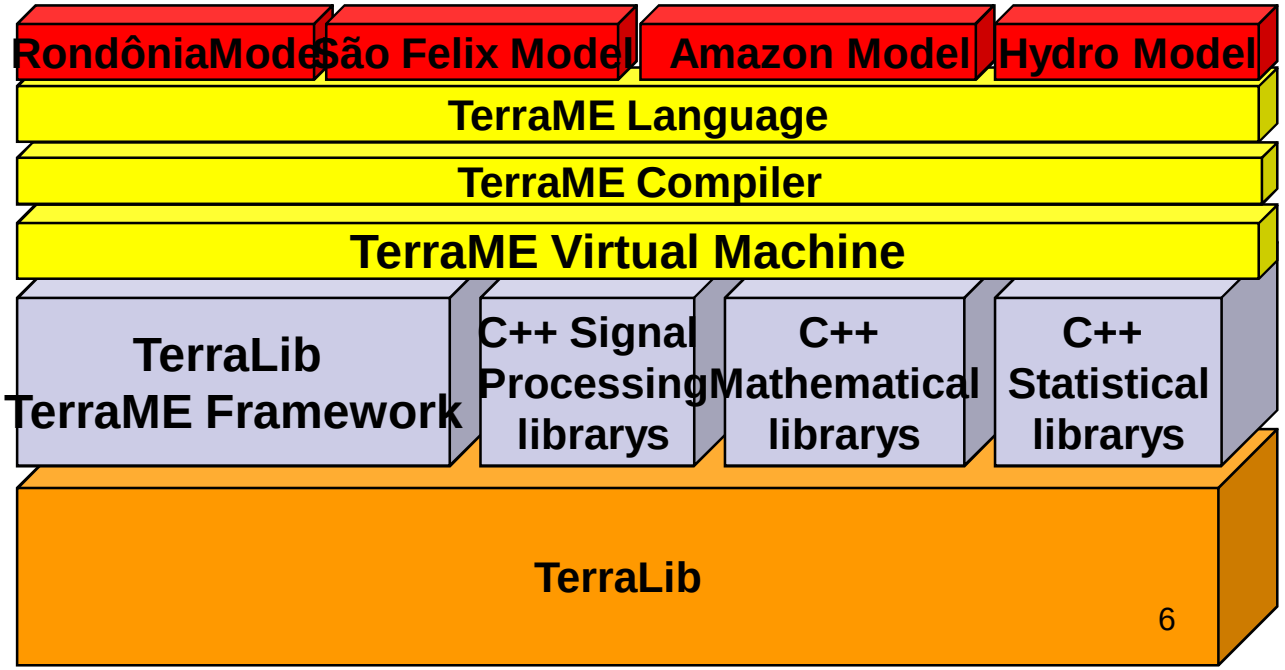


2. TerraME

- TerraLib Modeling Environment *(Carneiro, 2003)*
- Component of TerraLib *(Câmara et al. 2000)*
- Provides features to develop and simulate models that has explicit spatial representation
- Provides mechanisms to represent and simulate dynamic spatial models integrated with GIS
- Provides the creation of models with multiple scales: spatial, temporal and behavioral

2. TerraME

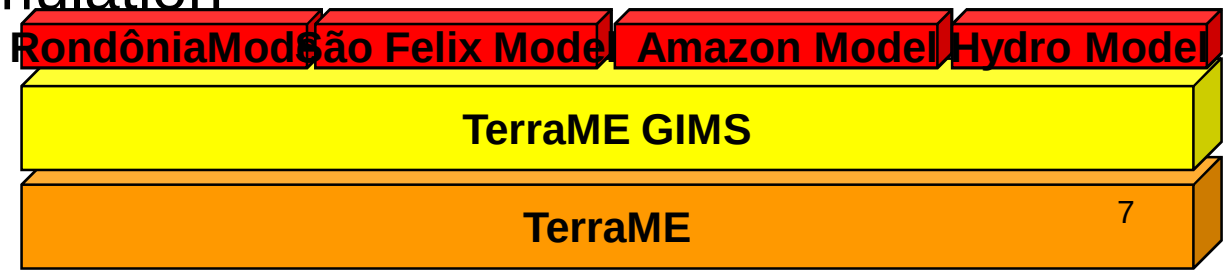
- Layer architecture
- Experts programmers x beginners programmers
- TerraME programming language



(Carneiro, 2003)

3. Goals

- Develop a new layer of abstraction that helps end-users to describe and represent models using the TerraME environment
  - turns TerraME more easier to use for non-programmers users
  - improve the produtivity on development of models
  - enlarge the community of users
- TerraME GIMS: TerraME Graphical Interface for Modeling and Simulation



Adapted from (Carneiro, 2003)

4. Motivation

- The TerraME Programming Language, although simple, restricts the use of TerraME

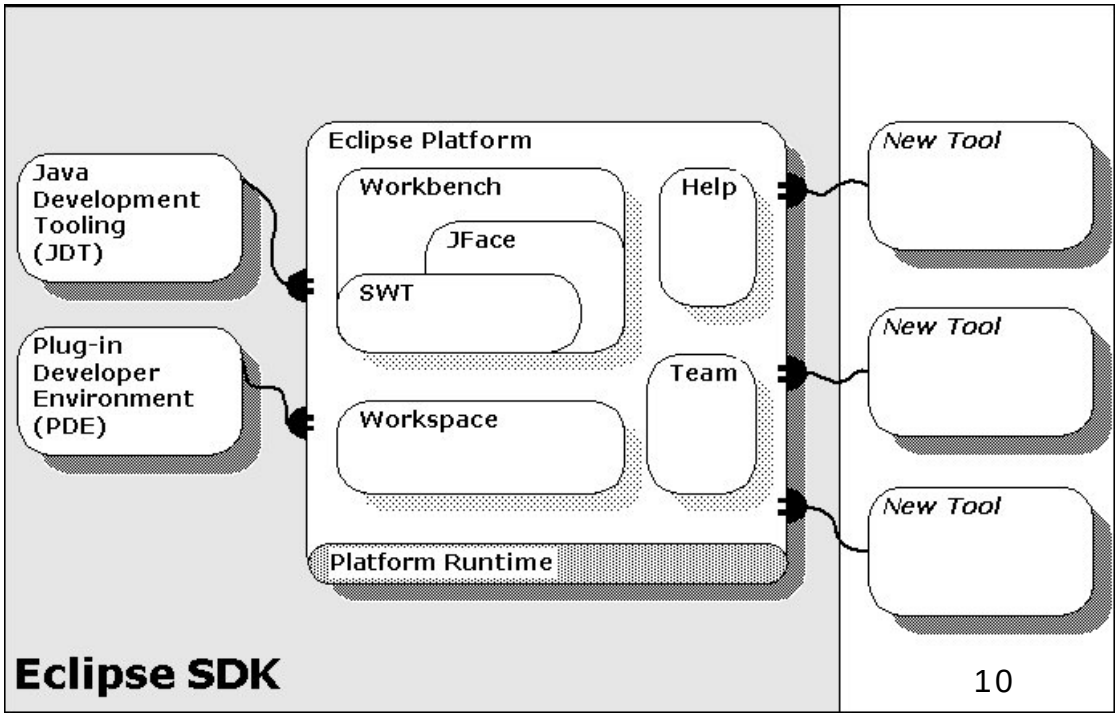
- Allow users focus on solving issues pertaining to the field of applications of the models

5. Methodology

- Develop a system for computing and computational model for a socio-environmental phenomena are essentially similar activities
- IDE – Integrated Development Environment
- High cost of development

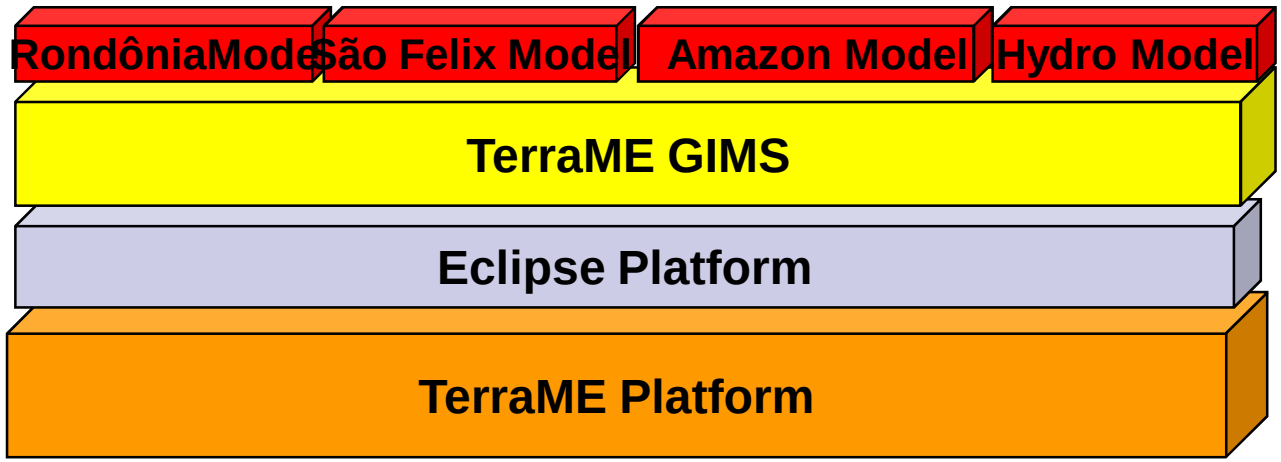
5. Methodology

- Eclipse
  - Open source IDE
  - Plug-in architecture
  - Extensible
  - Large community of users



6. Results

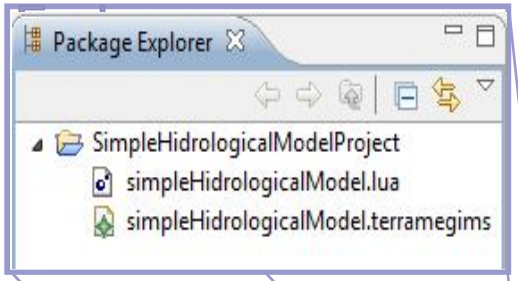
- TerraME GIMS – allows the construction of TerraME models through interaction with graphics components
- Architecture
  - New layer between the TerraME and the end-user applications
  - Build and distributed as a set of plug-ins for Eclipse



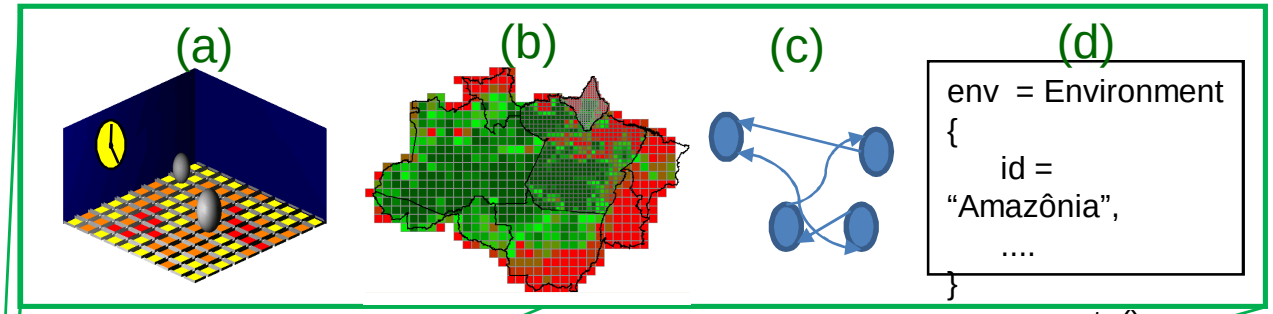
Adapted from (Carneiro, 2003)

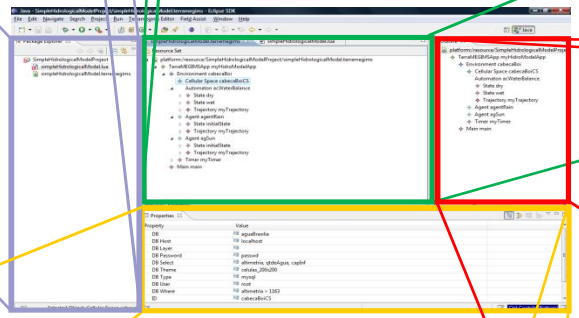
TerraME GIMS Interface

Model Package

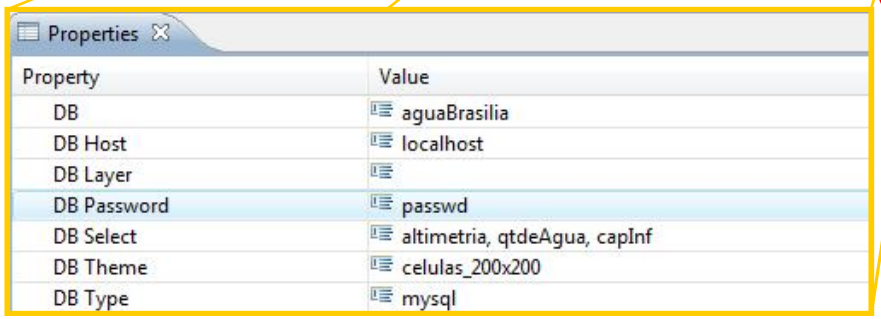


Model Graphical Editor

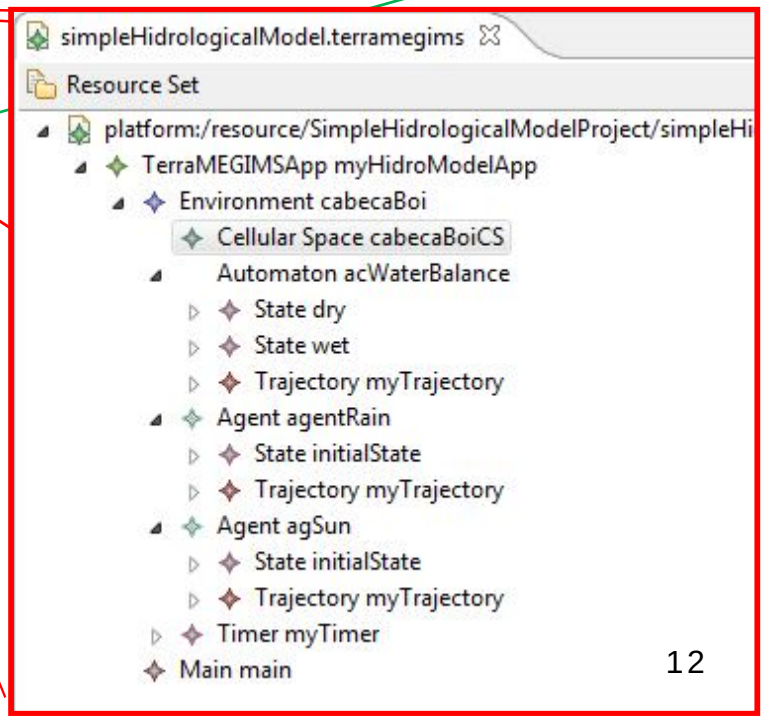




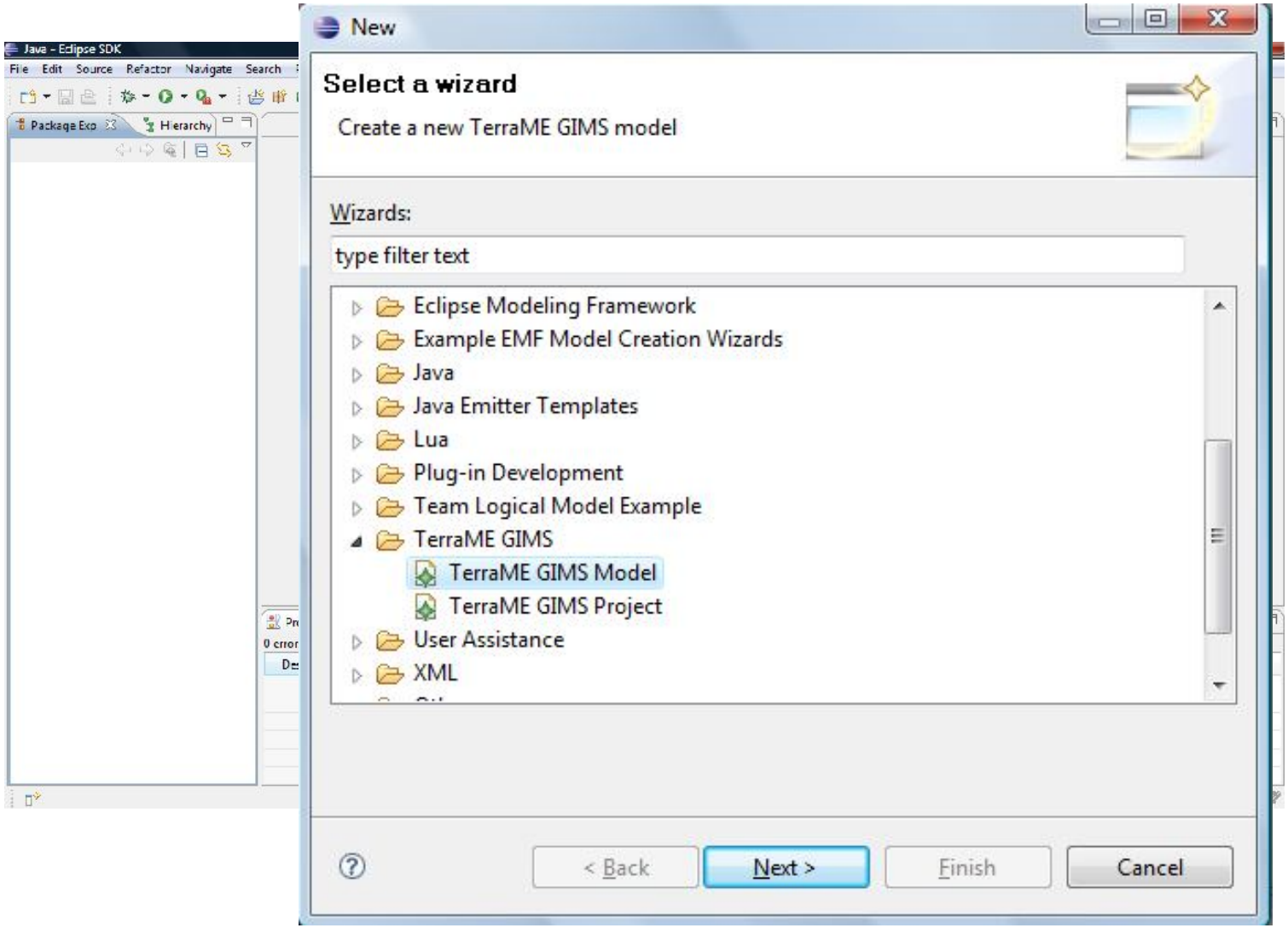
Model Property Editor



Model Structure Editor



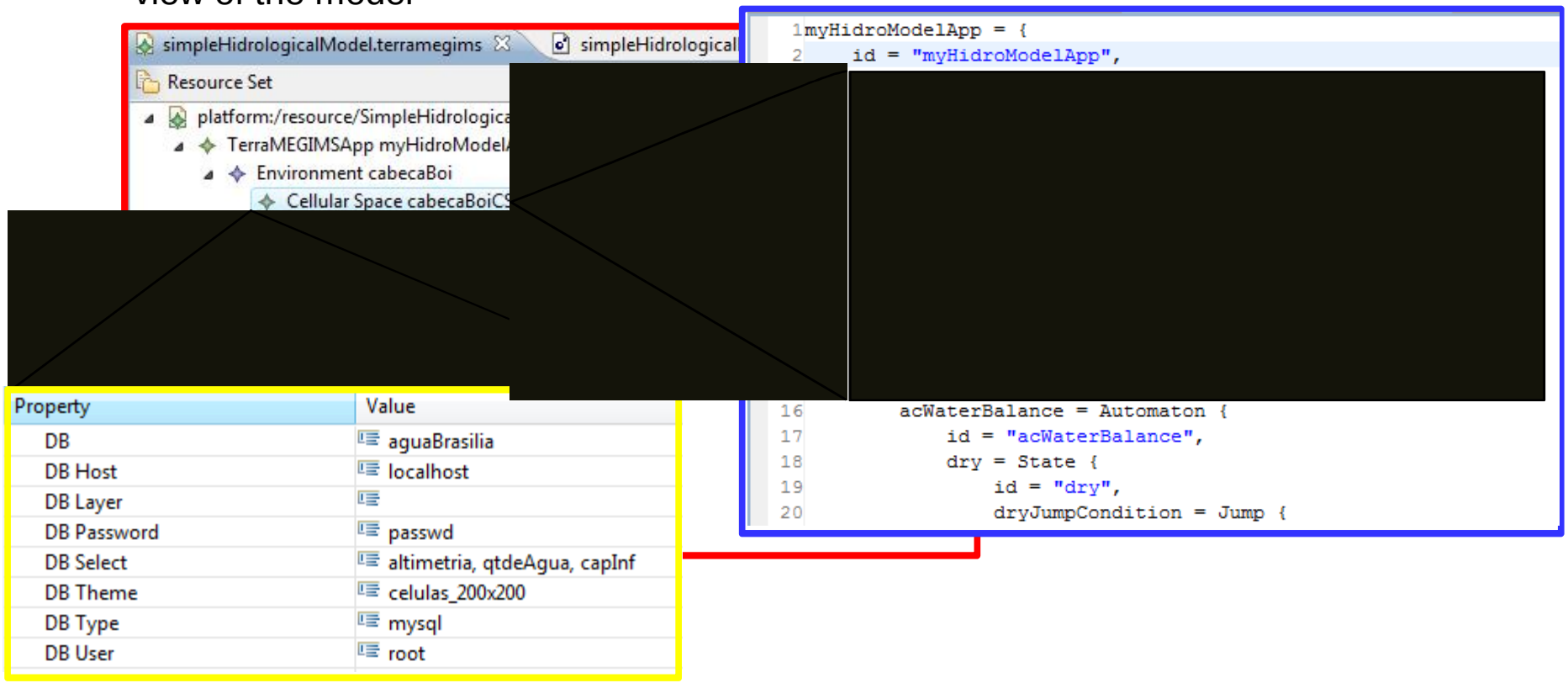
6. TerraME GIMS – present stage



6. TerraME GIMS – present stage

Model Structure Editor – hierarchical view of the model

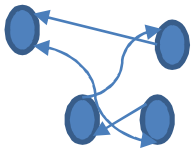
Model Graphical Editor –TerraME source code created automatically



Model Property Editor – view and edit properties of elements

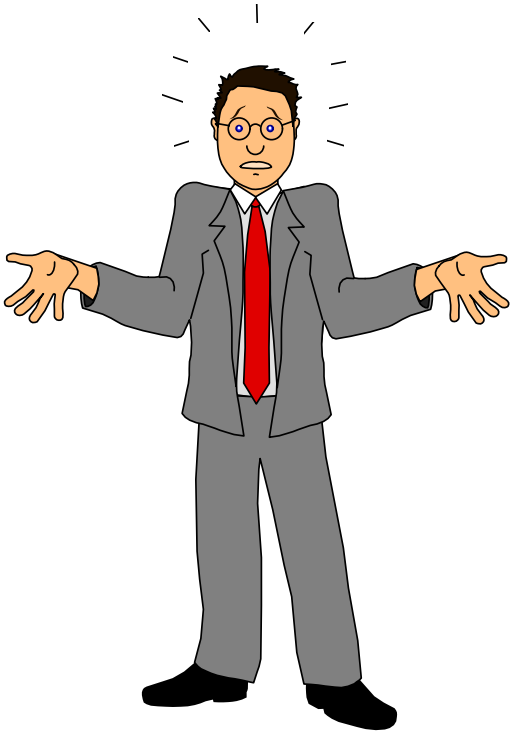
6. Final considerations and future works

- The preliminary version allows glimpse the potencial of TerraME GIMS
- The use of Eclipse, despite making development more complex, provides a range of facilities such as support for version control, search tools, among others
- Next steps
  - graphical description of *Agents* and *Automatons*
  - assessment of usability of the interface
  - learnability of TerraME concepts with TerraME GIMS



Thanks

Questions?



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