

The Eclipse logo consists of the word "eclipse" in a white, lowercase, sans-serif font, centered within a dark blue rectangular box. The box has a subtle gradient and a faint circular glow behind the text.

The Eclipse/GMT **MoDisco** Component



Overview

Outline

- Introduction
- Background
- Discovery Principles
- Motivating Examples
- Component Description
- Benefits of the Approach
- Organization
- Roadmap
- First Use Cases Descriptions

Introduction

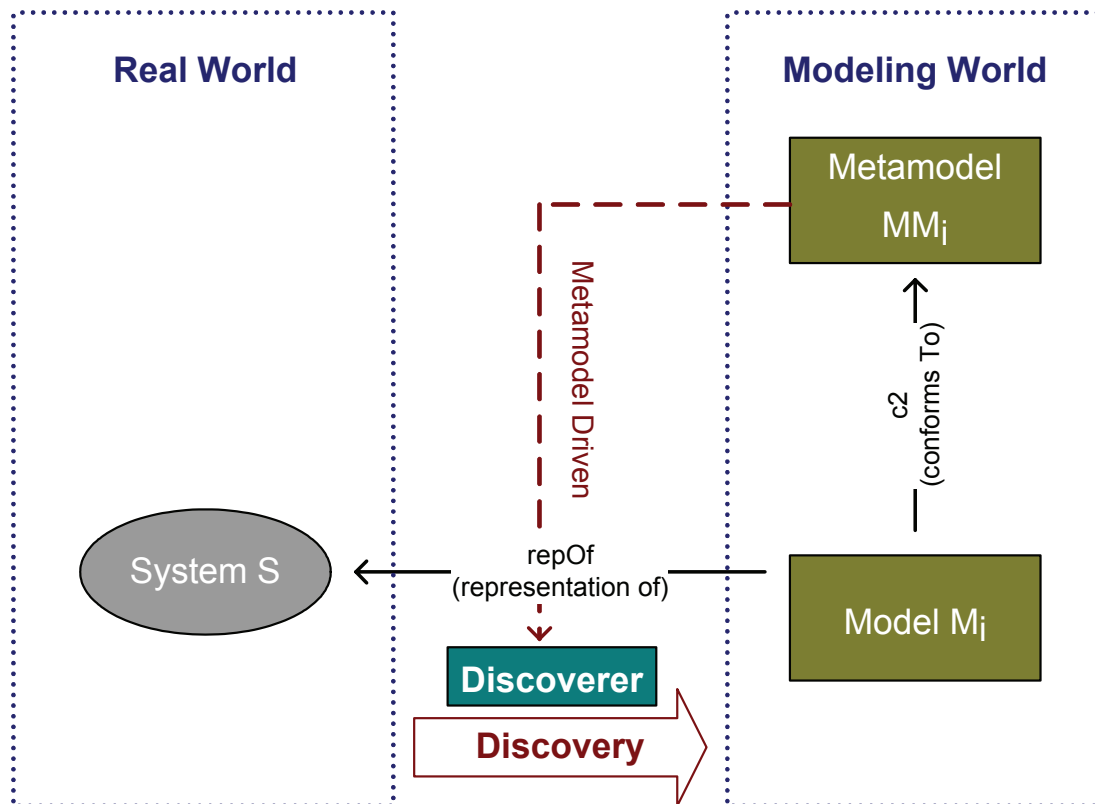
- MoDisco for "Model Discovery"
- Eclipse GMT component for model-driven reverse-engineering (MDRE)
- Extraction of models from legacy systems
 - Multiple types of such legacy systems
- A generic and extensible metamodel-driven approach to model discovery



Background

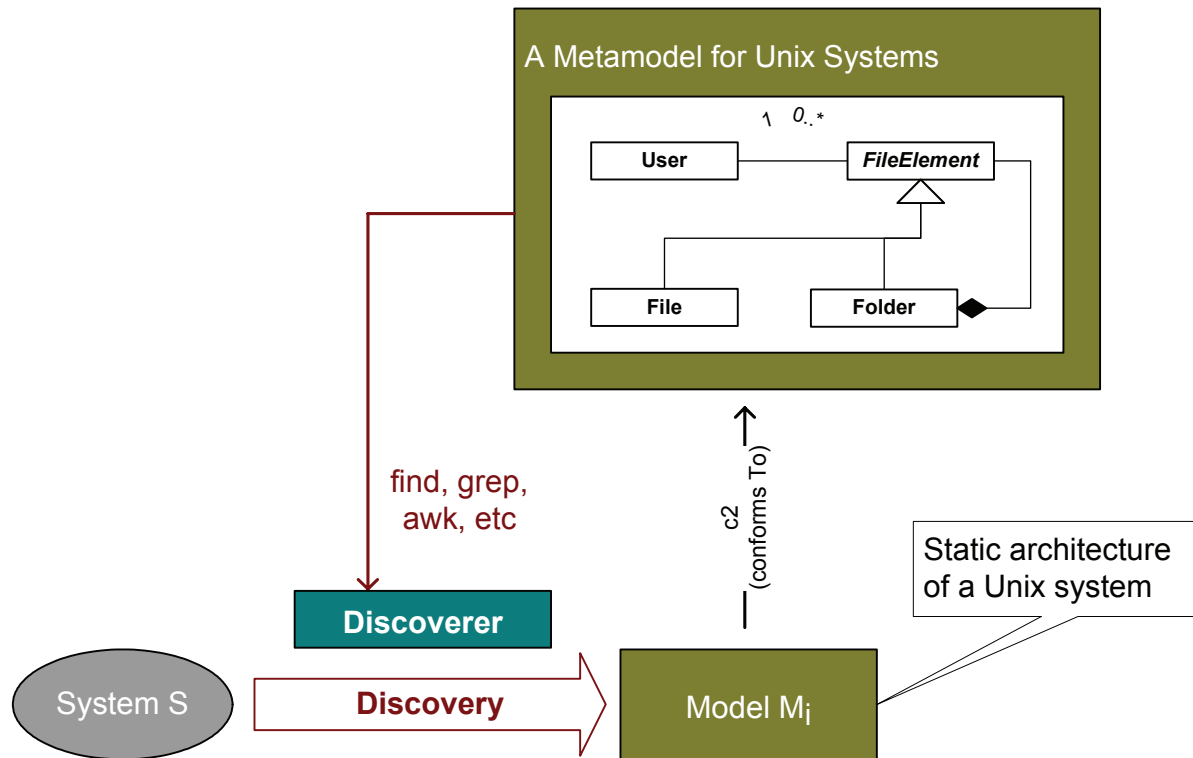
- Important issue:
 - Reverse-engineering of legacy systems
- **MoDisco** component's goal:
 - Provide an extensible base framework for performing metamodel-driven reverse engineering
- The key to success:
 - Adoption by leading industrials
 - Development of a wide user community in different application domains

Discovery Principles



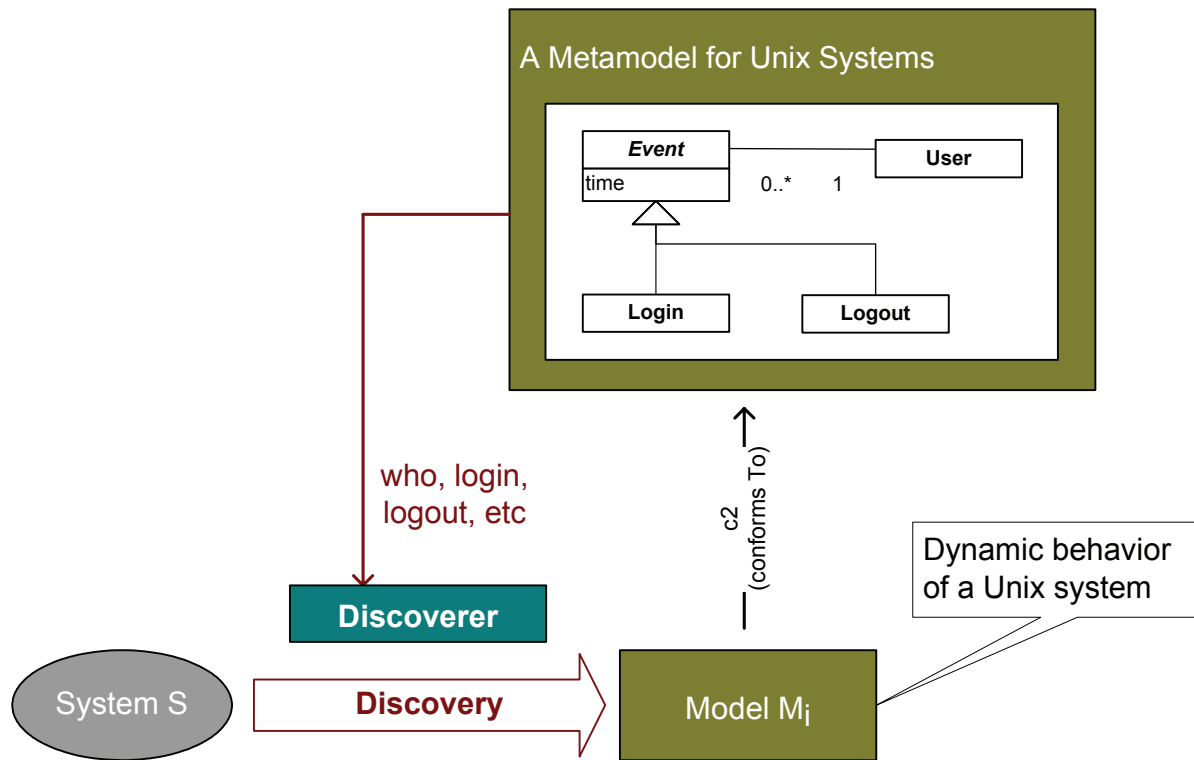
- Step 1:
 - Define the metamodel
- Step 2:
 - Create the "discoverer"
- Step 3:
 - Run the discoverer to extract model M_i from system S

Motivating Examples (1/4)



- Example of the Unix file system
- Study of a **static** view of the system
 - Snapshot of the system at time t

Motivating Examples (2/4)



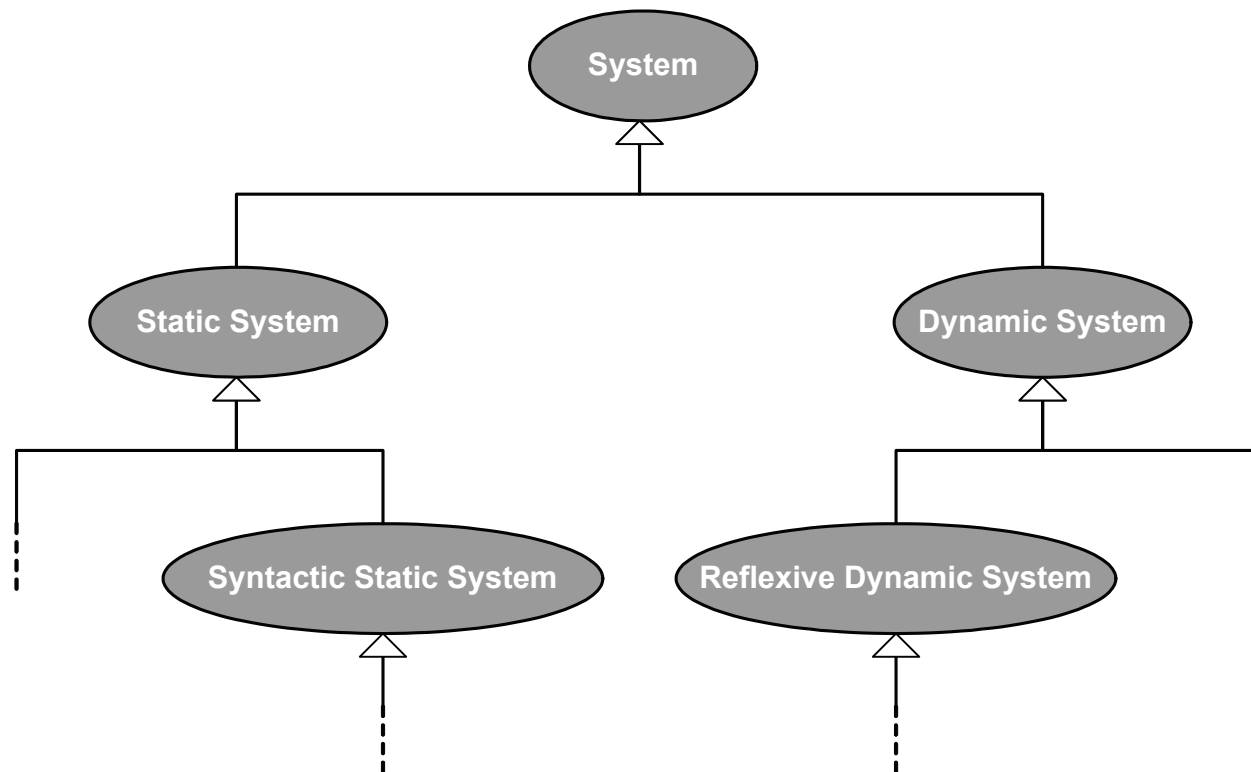
- Example of the Unix users' actions
- Study of the **dynamic** behavior of the system
 - Execution trace of the system

Motivating Examples (3/4)

- Conclusions:
 - The same general discovery process is applied in both examples
 - Only the nature of the "discoverers" is changing
 - Need for a system classification
 - A decision tree more than an absolute classification
 - Several points of view are possible on the same system
 - A support and methodology for facilitating the development of the "discoverers"
 - For instance, encouraging the use of the introspection capabilities in the case of a reflexive system

Motivating Examples (4/4)

- A possible system classification (basic very first version):

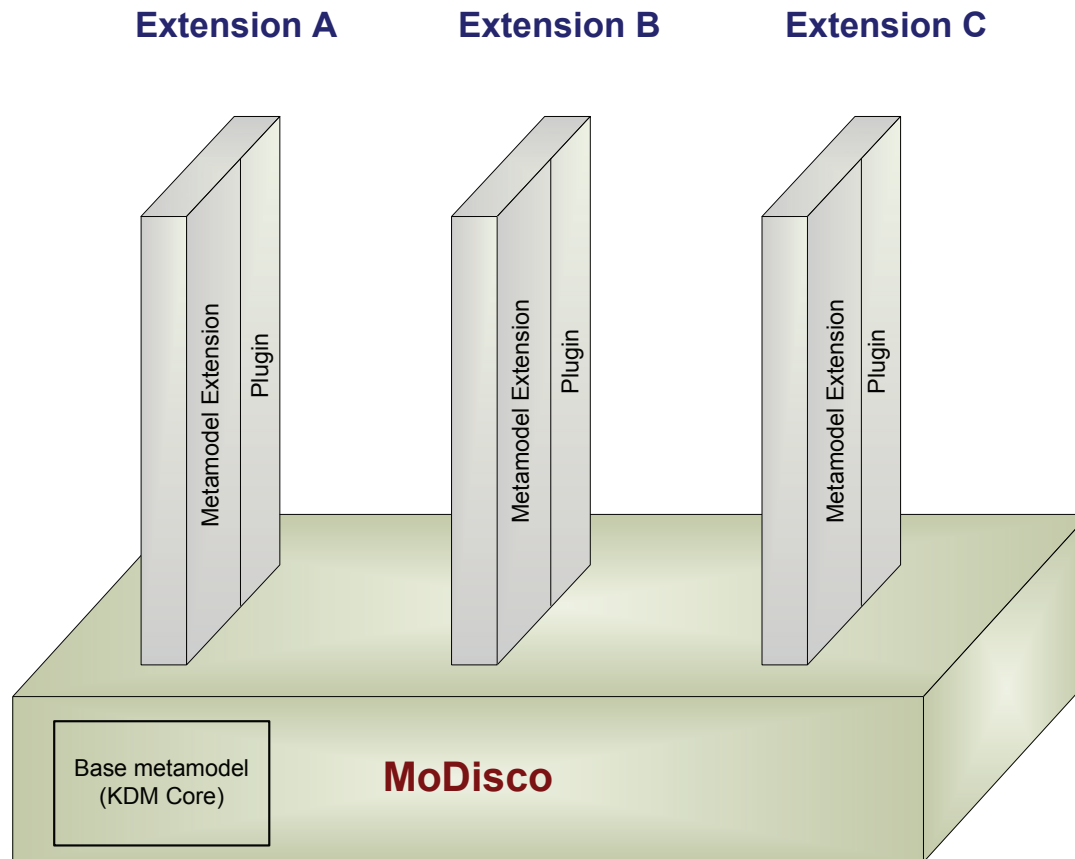


Component Description (1/2)

- A base generic and extensible framework
 - A core metamodel (based on the OMG™ KDM specification)
 - A metamodel extension's mechanism
 - Facilities for manipulating models
 - A methodology for designing extensions of this framework
 - An extension (or "blade") is a couple: extension of the core metamodel + plugin
 - Different extensions for different domains in various fields

Component Description (2/2)

- Overall vision of **MoDisco**:



Benefits of the Approach

- A unified model-based approach and a metamodel-driven methodology:
 - Work in the homogeneous world of the models
 - Match different requirements
 - Data integration, tools interoperability, systems migration, etc
 - Use models properties and facilities
 - Transformations, weavings, extractions, etc
- A possible wide user community
- A common toolbox for MDRE

Organization (1/2)



- Creation of MoDisco supported by the **ModelPlex European Integrated Project** (FP6-IP #034081)



- Initial committers & contributors :
 - Hugo Bruneliere (INRIA)
 - Mikael Barbero (INRIA)



Organization (2/2)

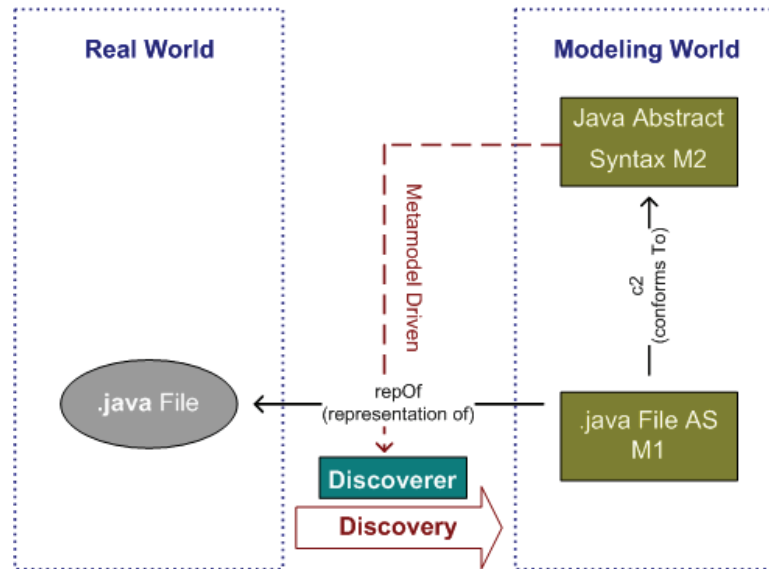
- Contributors and/or interested parties (industrials and academics):
 - INRIA 
 - University of Nantes 
 - MIA Software 
 - Sodius 
 - Obeo 

Roadmap

- **1. Creation and initialization of the project (general description, web site, newsgroup, etc).**
- **2. Elaboration of several use cases provided by different partners. A use case is usually composed of a specification and an implementation.**
- **3. Consolidification of the common toolbox and of the initial framework for building model discoverers. Improvement of the guidelines, methodological support and basic documentation.**
- **4. Improvement of the framework as additional use cases are built and contributed.**

First Use Cases Descriptions (1/3)

- Java Abstract Syntax

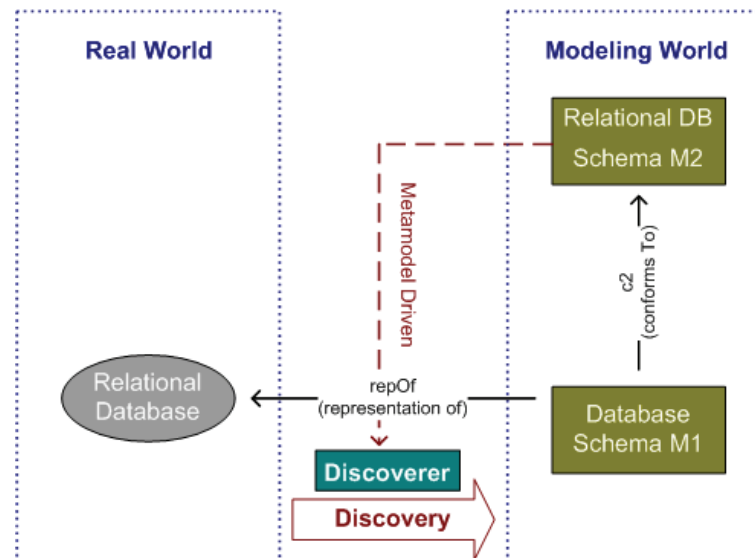


- Example of produced model (in XMI):

```
<statements xsi:type="java.ast:ExpressionStatement">
  <expression xsi:type="java.ast:MethodInvocation">
    <arguments xsi:type="java.ast:StringLiteral" escapedValue="&quot;Done !&quot;" literalValue="Done !"/>
    <expression xsi:type="java.ast:QualifiedName" fullyQualifiedName="System.out">
      <name fullyQualifiedName="out" identifier="out"/>
      <qualifier xsi:type="java.ast:SimpleName" fullyQualifiedName="System" identifier="System"/>
    </expression>
    <name fullyQualifiedName="println" identifier="println"/>
  </expression>
</statements>
```

First Use Cases Descriptions (1/3)

- Relational Database Schema

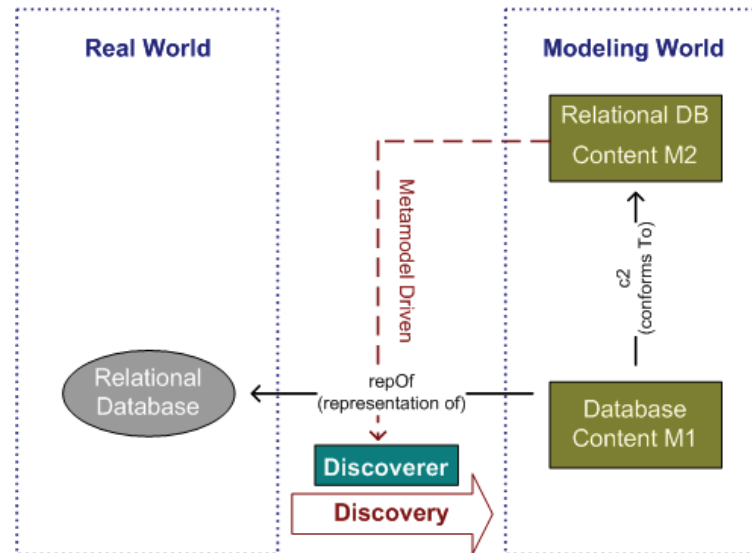


- Example of produced model (in Ecore):

```
<tables name="employees" key="###@tables.1/@columns.0">
  <columns name="employeeNumber" dataType="int(11)" defaultValue="" keyOf="###@tables.1"/>
  <columns name="lastName" dataType="varchar(50)" defaultValue=""/>
  <columns name="firstName" dataType="varchar(50)" defaultValue=""/>
  <columns name="extension" dataType="varchar(10)" defaultValue=""/>
  <columns name="email" dataType="varchar(100)" defaultValue=""/>
  <columns name="officeCode" dataType="varchar(10)" defaultValue=""/>
  <columns name="reportsTo" dataType="int(11)" null="true"/>
  <columns name="jobTitle" dataType="varchar(50)" defaultValue=""/>
</tables>
```

First Use Cases Descriptions (1/3)

- Relational Database Content



- Example of produced model (in Ecore):

```

<tables name="employees">
- <tuples>
  <elements value="1002"/>
  <elements value="Murphy"/>
  <elements value="Diane"/>
  <elements value="x5800"/>
  <elements value="dmurphy@classicmodelcars.com"/>
  <elements value="1"/>
  <elements/>
  <elements value="President"/>
</tuples>

```

End

- **Thank you**
 - Questions?
 - Comments?
- **MoDisco website**
 - <http://www.eclipse.org/gmt/modisco>
- **MoDisco newsgroup**
 - <news://news.eclipse.org/eclipse.modeling.gmt.modisco>
- **Contacts**
 - Jean.Bezivin@univ-nantes.fr
 - Hugo.Bruneliere@univ-nantes.fr
 - Mikael.Barbero@univ-nantes.fr

