

Model Interchange Working Group (MIWG)

December 7, 2009

<http://www.omgwiki.org/model-interchange>

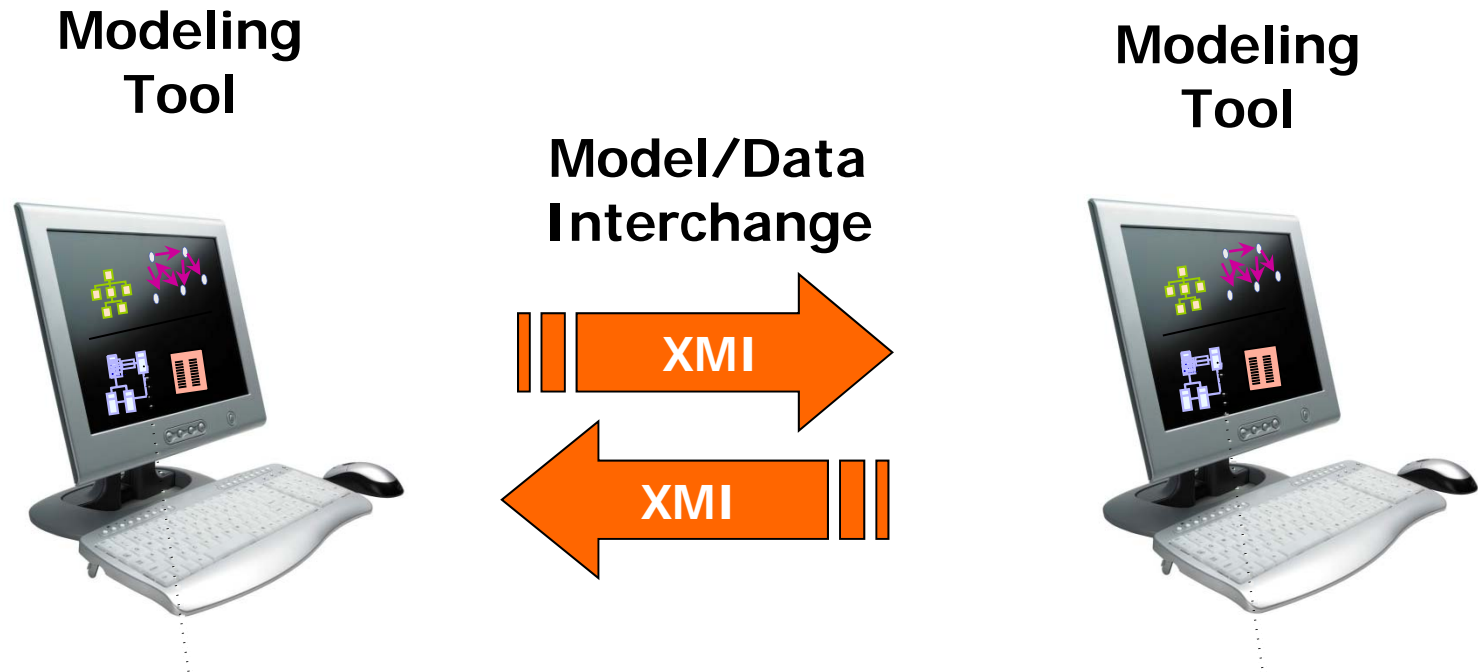
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Model Interchange Working Group (MIWG) Objectives and Approach



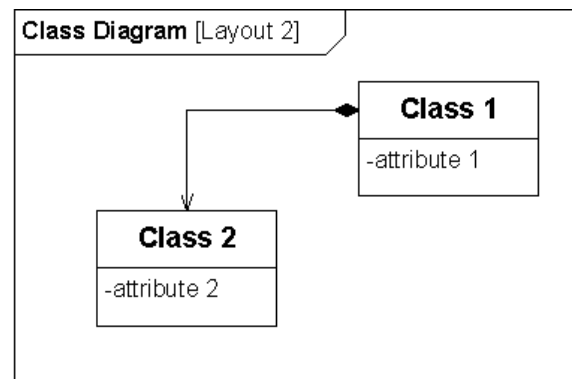
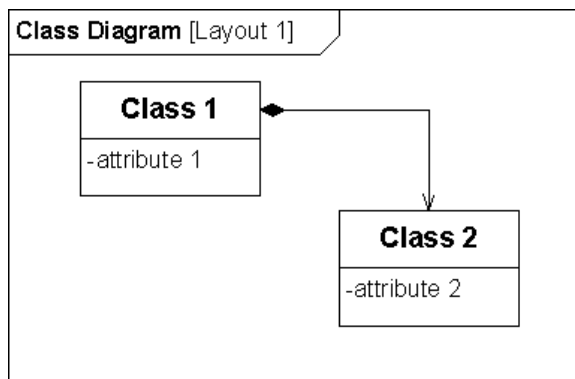
- Objectives
 - Enhance and demonstrate interoperability of MOF/XMI-based tools with initial focus on model interchange among UML, SysML, and UPDM-capable tools
- Approach
 - Multiple vendors involved
 - Each release incrementally adds test cases
 - Each test case tests additional interchange capabilities among vendor tools
 - Process includes identification and resolution of interchange issues, and demonstration of interchange capability

Model Interchange Via XMI



Model Interchange vs Diagram Interchange

- Model interchange with XMI exchanges model information (e.g., classes, associations, activities)
- Interchange does not include diagram layout information
- Most tools provide auto-layout capability to quickly generate the diagrams from the model information
- Future OMG efforts will leverage XMI to also include exchange of diagram layout information



Current Vendor Demo Participants

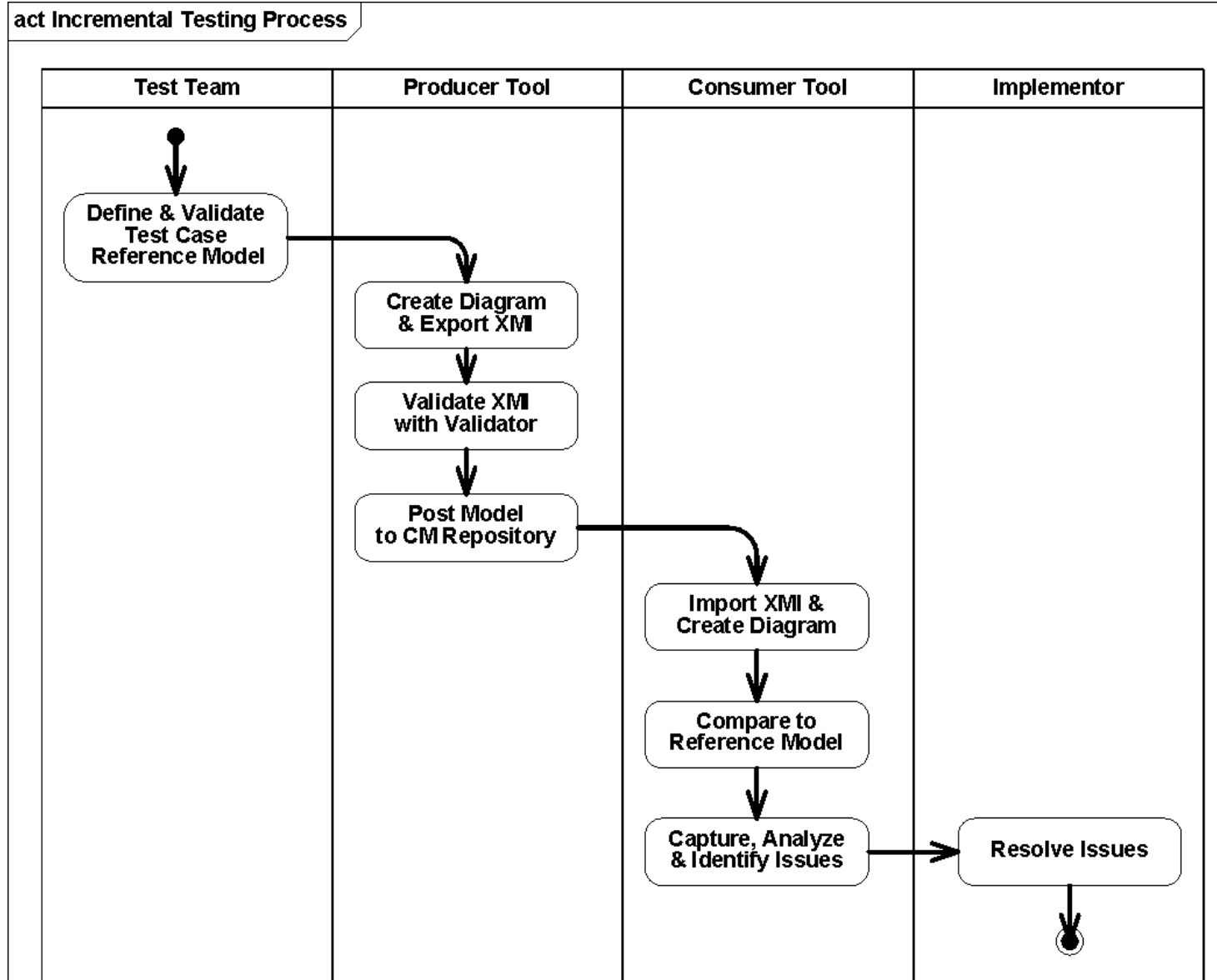


- Artisan® Studio
- IBM RSx
- IBM Rhapsody
- NoMagic MagicDraw
- SOFTEAM Modelio
- Sparx Systems Enterprise Architect

MIWG Results

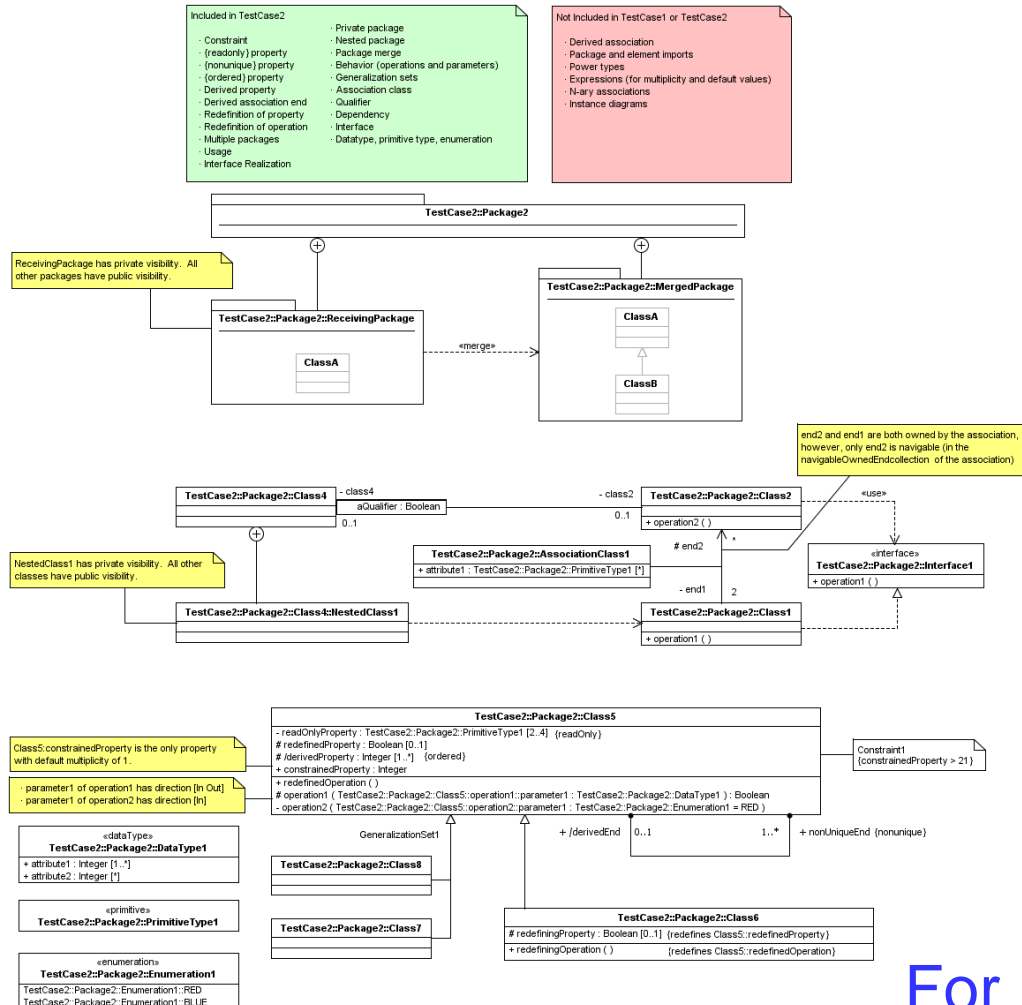
- MIWG kickoff 1 year ago (Dec ' 08)
- Completed 6 test cases to date
- General exchange capability demonstrated among vendors, but some issues remain
- Vendors continue to update their tools to address interchange issues
- Refinements to UML spec identified to reduce ambiguity and correct errors
- Guidelines being established for vendor interoperability
- Expect 80+% test case coverage of UML by end Q1 2010

Incremental Testing Process



Example Test Case #2

Reference Diagram (partial)



Example Test Case #2

Reference XML (partial)

```
<?xml version="1.0" encoding="UTF-8"?>
<uml:Model xmi:version="2.1" xmlns:xmi="http://schema.omg.org/spec/XML/2.1"
  xmlns:uml="http://schema.omg.org/spec/UML/2.1.1" xmi:id="_0" name="TestCase2">
  <packagedElement xmi:type="uml:Package" xmi:id="Package2" name="Package2">
    <packagedElement xmi:type="uml:Package" xmi:id="Package2-MergedPackage" name="MergedPackage">
      <packagedElement xmi:type="uml:Class" xmi:id="Package2-MergedPackage-ClassA" name="ClassA"/>
      <packagedElement xmi:type="uml:Class" xmi:id="Package2-MergedPackage-ClassB" name="ClassB">
        <generalization xmi:type="uml:Generalization" xmi:id="Package2-MergedPackage-ClassB-
          _generalization.0" general="Package2-MergedPackage-ClassA" specific="Package2-MergedPackage-
            ClassB"/>
      </packagedElement>
    </packagedElement>
  <packagedElement xmi:type="uml:PrimitiveType" xmi:id="Package2-PrimitiveType1"
    name="PrimitiveType1"/>
  <packagedElement xmi:type="uml:Package" xmi:id="Package2-ReceivingPackage"
    name="ReceivingPackage" visibility="private">
    <packageMerge xmi:type="uml:PackageMerge" xmi:id="Package2-ReceivingPackage-_packageMerge.0"
      mergedPackage="Package2-MergedPackage" receivingPackage="Package2-ReceivingPackage"/>
    <packagedElement xmi:type="uml:Class" xmi:id="Package2-ReceivingPackage-ClassA" name="ClassA"/>
  </packagedElement>
  <packagedElement xmi:type="uml:Class" xmi:id="Package2-Class1" name="Class1"
    clientDependency="Package2-Class1-_interfaceRealization.0">
```

.....

For illustration only

Incremental Test Cases

Progress To Date

Baseline Specifications: UML 2.1.1 / XMI 2.1

- Test Case 1 - Basic class modeling (complete)
- Test Case 2 - Advanced class modeling (complete)
- Test Case 3 - Profile definition and application (complete)
- Test Case 4 - Simple activity * (complete)
- Test Case 5 - Advanced activity *(complete)
- Test Case 6 – Composite structure (complete)


* Included testing of activity execution using reference implementation for the “Semantics of a Foundational Subset for Executable UML Models” (fUML) specification

Vendor Interchange Capability Matrix (December 7, 2009)



Producing Tool		Artisan Studio	MagicDraw	Rhapsody	IBM RSx	Modelio	Enterprise Architect	Reference XMI	
Test Case		1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	
Consuming Tool	Ver								
Artisan Studio	7.1		2 2 B B	2 2 B B	4 2 B B	3 2 B B	2 2 A B	4 2 B B	
MagicDraw		4 2 A A A A		2 2 2 2 A 3	4 3 3 4 4 4	4 2 2 2 3 3	2 2 A 2 2 2	4 4 4 4 4 4	
Rhapsody		3 2 A A A A	2 2 2 4 B 3		3 3 3 4 B 3	3 3 3 2 B 2	3 3 A 1 B	B B B B B B	
IBM RSx	7.5.5/8.0	4 3 A A A A	3 3 3 3 2 3	3 3 3 3 A 3		3 3 2 3 3 3	4 2 2 3 1 3	4 4 4 4 4 4	
Modelio	1.1	3 2 A A A A	3 2 2 3 2 3	2 2 2 2 A 2	4 4 3 4 3 3		3 2 3 2 B B	4 4 4 4 4 4	
Enterprise Architect	7.5+	2 2	2 2 3 4 3 2	2 2 4 0 A 3	2 2 4 4 3 2	2 2 2 3 2 2		2 2 4 4 4 2	
Validator		4 3 A A A A	B B B B	B B B B	4 4 3 3 3 3	B B B B	B B B B	B B B B	

Interchange Capability

N/A	A	No export posted yet		Stale data - reexport performed - awaiting reimport results
N/A	B	No Import results posted yet		
Zero	0	Import failed - none of the test data was imported		
Low	1	Some but not all of the first class model items were imported - potentially a wide band		
Medium	2	All of the first class model items were imported but with significant issues (incorrect detail)		
High	3	All of the model items were imported with a few minor but no significant issues (small number of minor incorrect detail)		
Perfect	4	A perfect interchange - all model elements and all of their details were transferred 100% correctly		

Baseline Specifications: UML 2.1.1 / XMI 2.1

- Test Case 1 - Basic class modeling
- Test Case 2 - Advanced class modeling
- Test Case 3 - Profile definition and application
- Test Case 4 - Simple activity
- Test Case 5 - Advanced activity
- Test Case 6 – Composite structure

Disclaimer: This matrix represents preliminary interchange testing results from test cases 1-6 as of December 7, 2009. The model interchange working group (MIWG) participating vendors provided an assessment of their ability to import the other vendors XMI for each test case using the legend indicated, by inputting the data in the row corresponding to their name. The assessment represents the consuming tool import capability and the producing tool export capability.

Incremental Test Cases Planned

UML 2.2 / XMI 2.1

- Complete UML (80+%)
 - Release 6 (State machines, Use Cases)
 - Release 7 (Interactions, Collaborations)
 - Release 8 (Retest of test cases 1-6 using UML 2.2)
 - Release 9 (Composite test case)
- SysML
 - Release 10 (Blocks/parts, Activity swim lanes)
 - Release 11 (Requirements, Additional UML functionality)
 - Release 12 (Parametrics, Additional UML functionality)
 - Release 13 (Allocations, Additional UML functionality)
- UPDM
 - Release 14
 - Release

Summary

- Defined and validated incremental testing process
- Conducted Test Cases 1-6
 - Exchange of models based on class diagrams, activity diagrams, composite structure, and profile mechanism
 - Demonstrated significant interchange capability among multiple vendors
- Continue Incremental Testing
 - Extend coverage across UML, SysML, and UPDM
 - Specification updates
 - Vendor tool updates

**Commitment from Vendor Community
Resulting in Good Progress**