

High-level Differencing, Patching and Merging of EMF Models



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Main research area: Model driven software development

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- 2 SiLift Tools
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Introduction



SiLift

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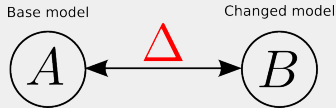
Introduction

SiLift Tools

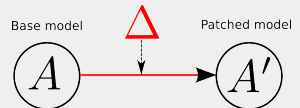
SiLift Approach

Summary

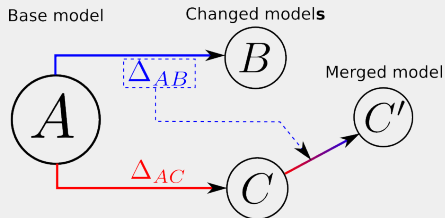
Differencing



Patching



Merging



SiLift

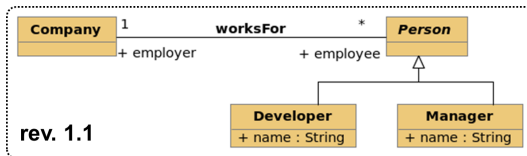
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SiLift

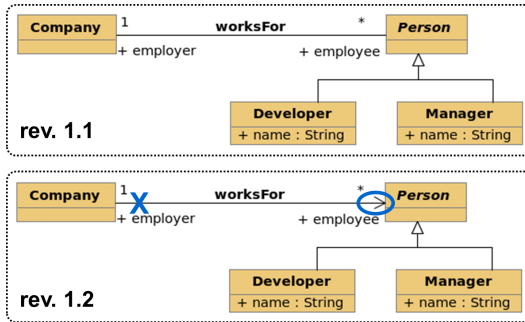
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Design Decision:
Restrict association
navigability



SiLift

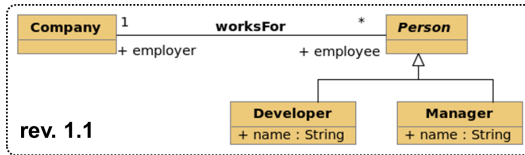
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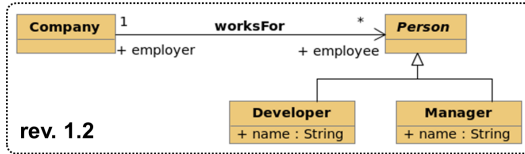
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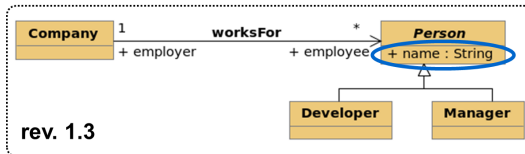
Summary



Design Decision:
Restrict association
navigability



Refactoring:
Pull up attribute



SiLift

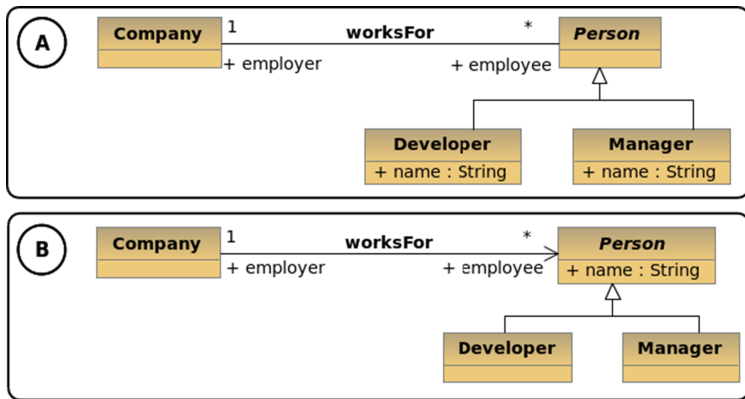
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What textual difference tools report...

SiLift

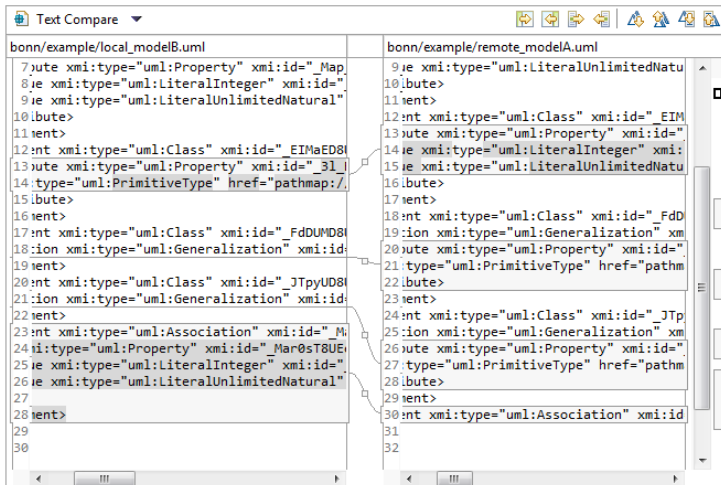
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```

bonn/example/local_modelB.uml
7:ute xmi:type="uml:Property" xmi:id="_Map
8:ie xmi:type="uml:LiteralInteger" xmi:id="
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10:bute>
11:ent>
12:nt xmi:type="uml:Class" xmi:id="_EIMaED8
13:ute xmi:type="uml:Property" xmi:id="
14:type="uml:PrimitiveType" href="pathmap:/
15:bute>
16:ent>
17:nt xmi:type="uml:Class" xmi:id="_FdDUMD8
18:ion xmi:type="uml:Generalization" xmi:id="
19:ent>
20:nt xmi:type="uml:Class" xmi:id="_JTPyUD8
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22:ent>
23:nt xmi:type="uml:Association" xmi:id=" M
24:i:type="uml:Property" xmi:id="_Mar0sT8UE
25:ie xmi:type="uml:LiteralInteger" xmi:id="
26:ie xmi:type="uml:LiteralUnlimitedNatural"
27
28:ent>
29
30

bonn/example/remote_modelA.uml
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10:bute>
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15:ie xmi:type="uml:LiteralUnlimitedNatu
16:bute>
17:ent>
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19:ion xmi:type="uml:Generalization" xm
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23:ent>
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26:ute xmi:type="uml:Property" xmi:id="
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28:bute>
29:ent>
30:nt xmi:type="uml:Association" xmi:id
31
32

```

What EMFCompare reports. . .

SiLift

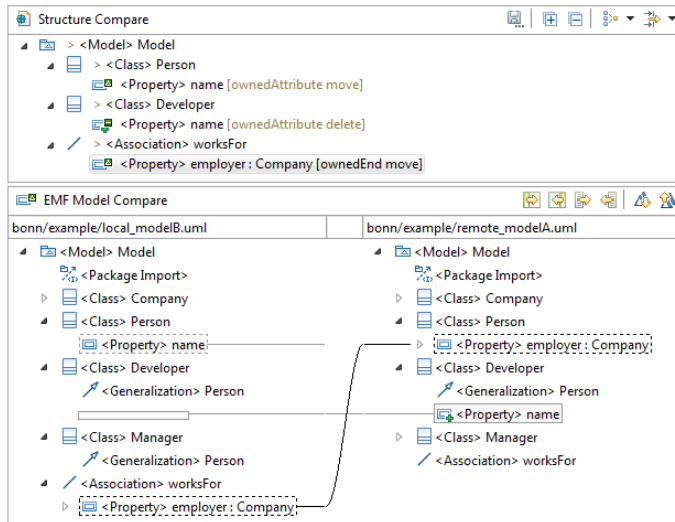
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SiLift

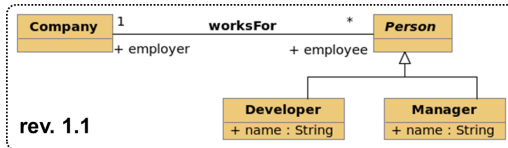
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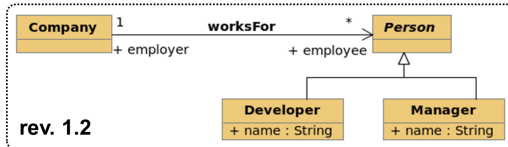
SiLift Tools

SiLift Approach

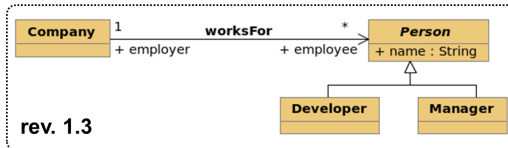
Summary



Design Decision:
Restrict association
navigability



Refactoring:
Pull up attribute



SiLift

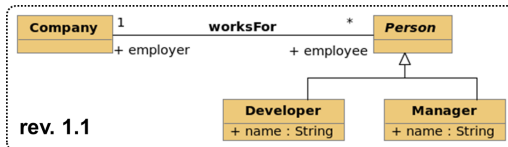
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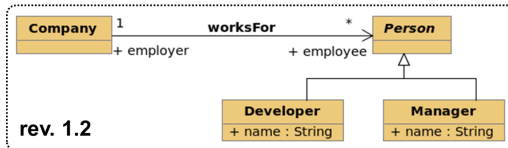
SiLift Approach

Summary



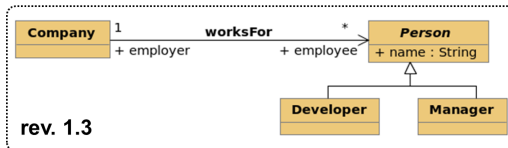
Design Decision:
Restrict association
navigability

Edit Operation



Refactoring:
Pull up attribute

Edit Operation



SiLift

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Section 2

SiLift Tools

SiLift

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Differencing

Base model

Changed model



SiLift

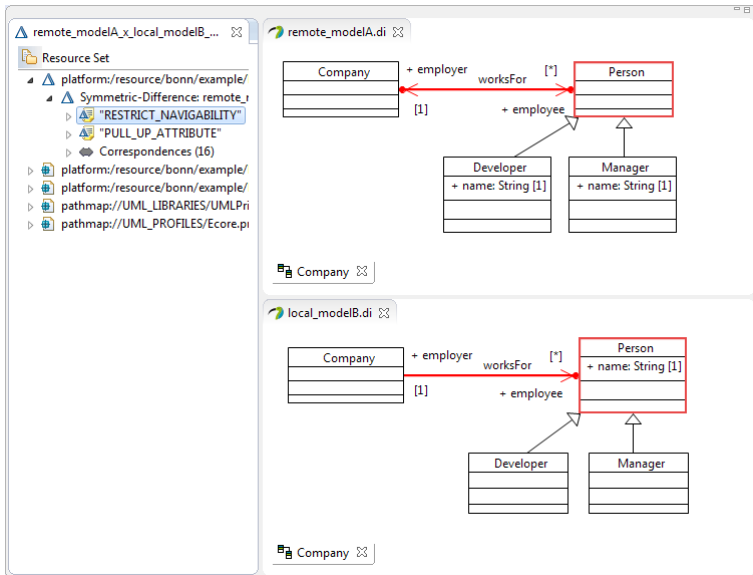
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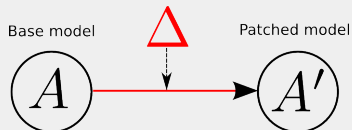
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Patching



SiLift

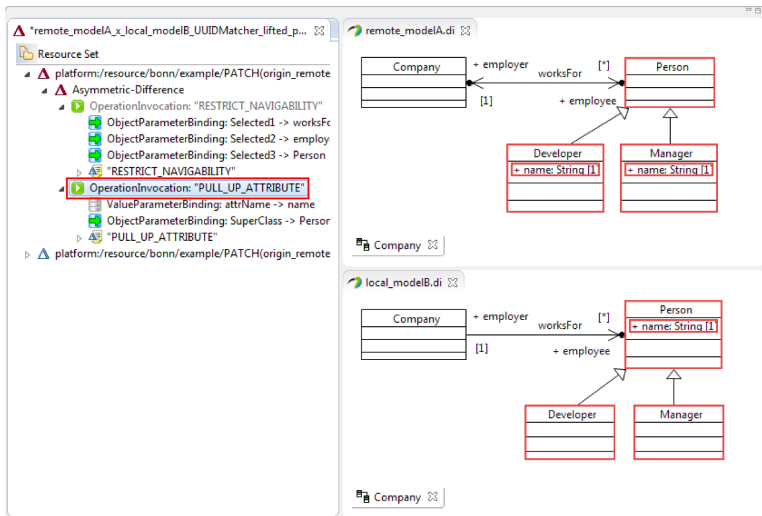
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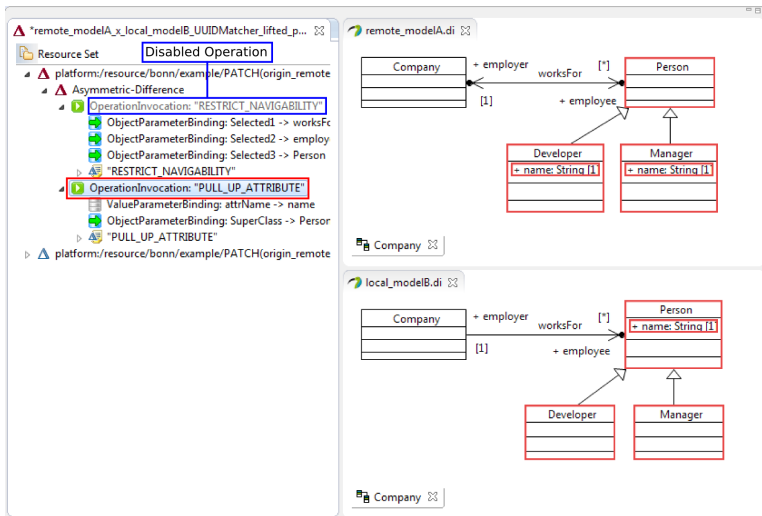
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Controlled Application of Model Patches (1)

SiLift

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Patch

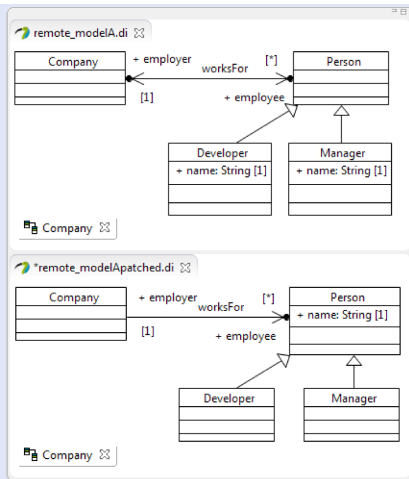
☐ Show Reliabilities

Operation	Argument
<input checked="" type="checkbox"/> RESTRICT_NAVIGABILITY	
Selected1	worksFor
Selected2	employer
Selected3	Person
<input checked="" type="checkbox"/> PULL_UP_ATTRIBUTE	
SuperClass	Person

Report

☒ PASSED ☒ SKIPPED ☒ FAILED ☒ WARNING

S...	Type	Description
	Parameter	ObjectParameter "Selected1" is set!
	Parameter	ObjectParameter "Selected2" is set!
	Parameter	ObjectParameter "Selected3" is set!
	Parameter	ObjectParameter "SuperClass" is set!
	Execution	RESTRICT_NAVIGABILITY
	Execution	PULL_UP_ATTRIBUTE



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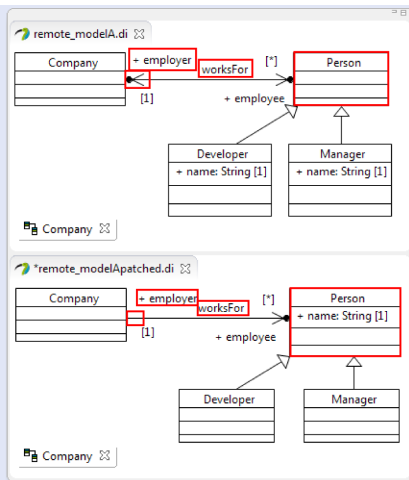
☐ Show Reliabilities

Operation	Argument
<input checked="" type="checkbox"/> RESTRICT_NAVIGABILITY	
Selected1	worksFor employer Person
Selected2	
Selected3	
<input checked="" type="checkbox"/> PULL_UP_ATTRIBUTE	
SuperClass	Person

Report

☒ PASSED ☒ SKIPPED ☒ FAILED ☒ WARNING

S...	Type	Description
●	Parameter	ObjectParameter "Selected1" is set!
●	Parameter	ObjectParameter "Selected2" is set!
●	Parameter	ObjectParameter "Selected3" is set!
●	Parameter	ObjectParameter "SuperClass" is set!
●	Execution	RESTRICT_NAVIGABILITY
●	Execution	PULL_UP_ATTRIBUTE



Controlled Application of Model Patches (3)

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Patch

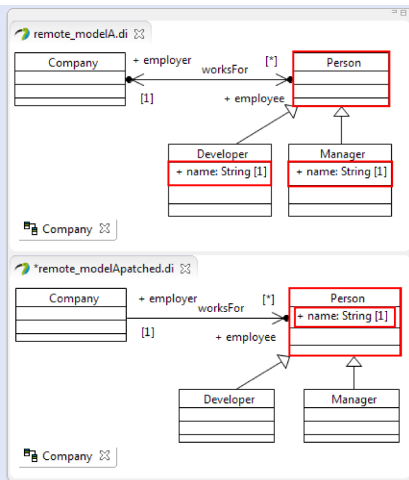
☐ Show Reliabilities

Operation	Argument
✓ RESTRICT_NAVIGABILITY	
Selected1	worksFor
Selected2	employer
Selected3	Person
✓ PULL_UP_ATTRIBUTE	
SuperClass	Person

Report

☒ PASSED ☒ SKIPPED ☒ FAILED ☒ WARNING

S...	Type	Description
●	Parameter	ObjectParameter "Selected1" is set!
●	Parameter	ObjectParameter "Selected2" is set!
●	Parameter	ObjectParameter "Selected3" is set!
●	Parameter	ObjectParameter "SuperClass" is set!
●	Execution	RESTRICT_NAVIGABILITY
●	Execution	PULL_UP_ATTRIBUTE



SiLift

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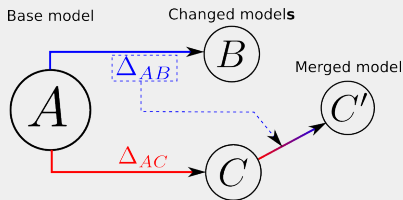
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Merging



Controlled Merging (1)

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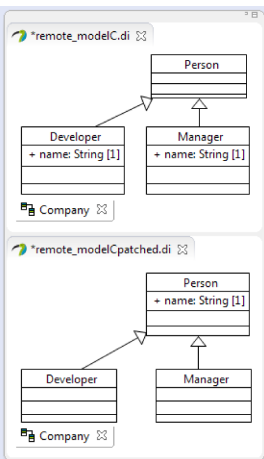
☐ Show Reliabilities

Operation	Argument
<input type="checkbox"/> RESTRICT_NAVIGABILITY	
Selected1	(Missing object: worksFor)
Selected2	(Missing object: employer)
Selected3	Person
<input checked="" type="checkbox"/> PULL_UP_ATTRIBUTE	
SuperClass	Person

Report

☒ PASSED ☒ SKIPPED ☒ FAILED ☒ WARNING

S...	Type	Description
●	Parameter	RESTRICT_NAVIGABILITY
●	Parameter	ObjectParameter "SuperClass" is set!
●	Parameter	[SuperClass] in PULL_UP_ATTRIBUTE has been modified!
●	Execution	RESTRICT_NAVIGABILITY
●	Execution	PULL_UP_ATTRIBUTE



Controlled Merging (2)

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Patch

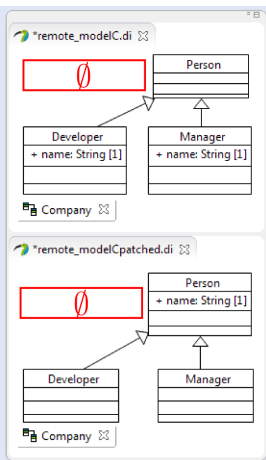
Show Reliabilities

Operation	Argument
<input type="checkbox"/> RESTRICT_NAVIGABILITY	
Selected1	(Missing object: worksFor)
Selected2	(Missing object: employer)
Selected3	Person
<input checked="" type="checkbox"/> PULL_UP_ATTRIBUTE	
SuperClass	Person

Report

☒ PASSED ☒ SKIPPED ☒ FAILED ☒ WARNING

S...	Type	Description
●	Parameter	RESTRICT_NAVIGABILITY
●	Parameter	ObjectParameter "SuperClass" is set!
●	Parameter	[SuperClass] in PULL_UP_ATTRIBUTE has been modified!
●	Execution	RESTRICT_NAVIGABILITY
●	Execution	PULL_UP_ATTRIBUTE



Controlled Merging (3)

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☐ Show Reliabilities

Operation	Argument
<input type="checkbox"/> RESTRICT_NAVIGABILITY	
<input type="checkbox"/> Selected1	(Missing object: worksFor)
<input type="checkbox"/> Selected2	(Missing object: employer)
<input type="checkbox"/> Selected3	Person
<input checked="" type="checkbox"/> PULL_UP_ATTRIBUTE	Person
<input type="checkbox"/> SuperClass	Person

Report

☒ PASSED ☒ SKIPPED ☒ FAILED ☒ WARNING

S...	Type	Description
	Parameter	RESTRICT_NAVIGABILITY
	Parameter	ObjectParameter "SuperClass" is set!
	Parameter	[SuperClass] in PULL_UP_ATTRIBUTE has been modified!
	Execution	RESTRICT_NAVIGABILITY
	Execution	PULL_UP_ATTRIBUTE

*remote_modelC.di

*remote_modelCpatched.di

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Section 3

SiLift Approach

SiLift Pipeline (low level)

SiLift

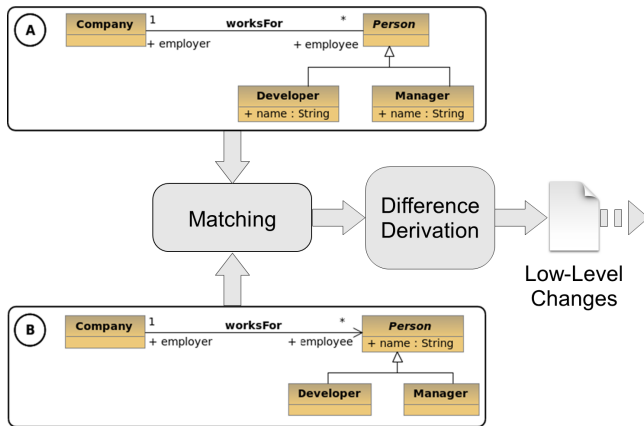
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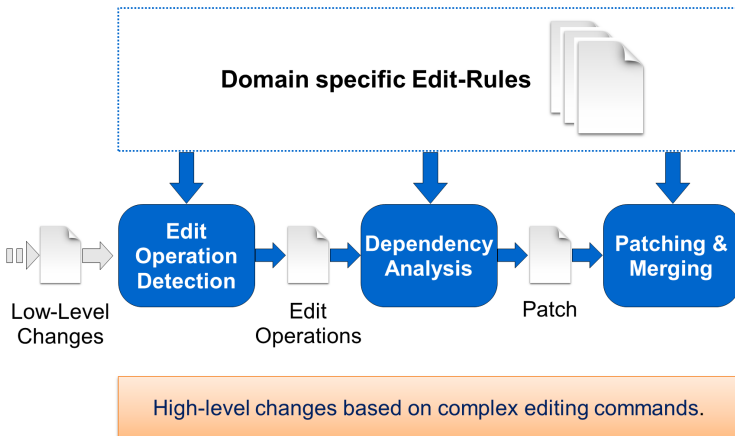
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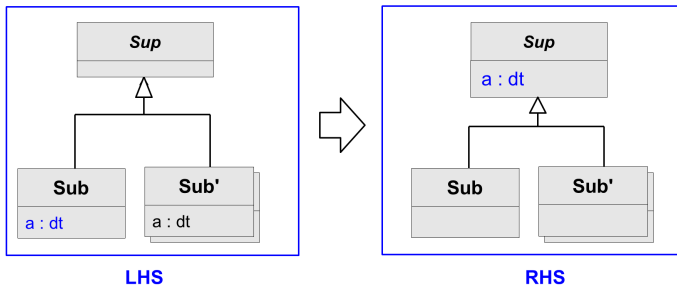
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pullUpAttribute(a)



SiLift

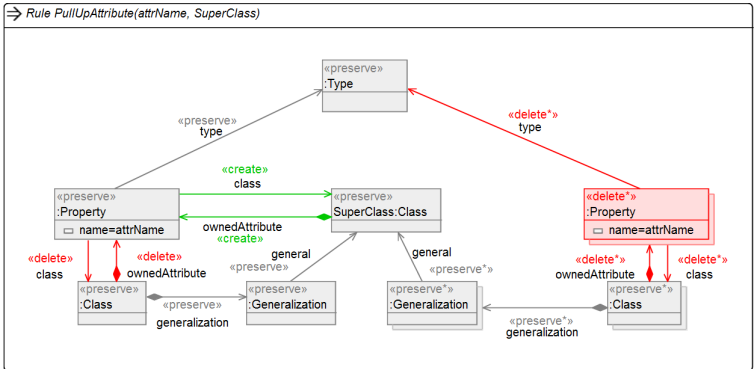
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Section 4

Summary



SiLift

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SiLift Tools

Support for High-level model-based

- Differencing
- Patching
- Merging

Contact/More information

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- mohrndorf@informatik.uni-siegen.de

Personal

- Now ;-)