SE SOFTWARE ENGINEERING

RWTH AACHEN UNIVERSITY

OCL/P

An overview to the
status of the MC project
OCL

FM
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http://www.se-rwth.de/

Language/Tool at a Glance

- Name: OCL
- Developed by: Ferdinand Mehlan, Michael von Wenckstern
- Based on: OCL 0.0.5

- Purpose of the language / tool:
  - encompass OCL expressions and constraints
  - provide an implementatioon for the language defined at: http://mbse.se-rwth.de/book1/index.php?c=chapter3
  - CLI to load OCL and CD and check for syntactical and type correctness

  - Last big iteration reworked the grammar and split into multiple expression grammars

Technical Briefing

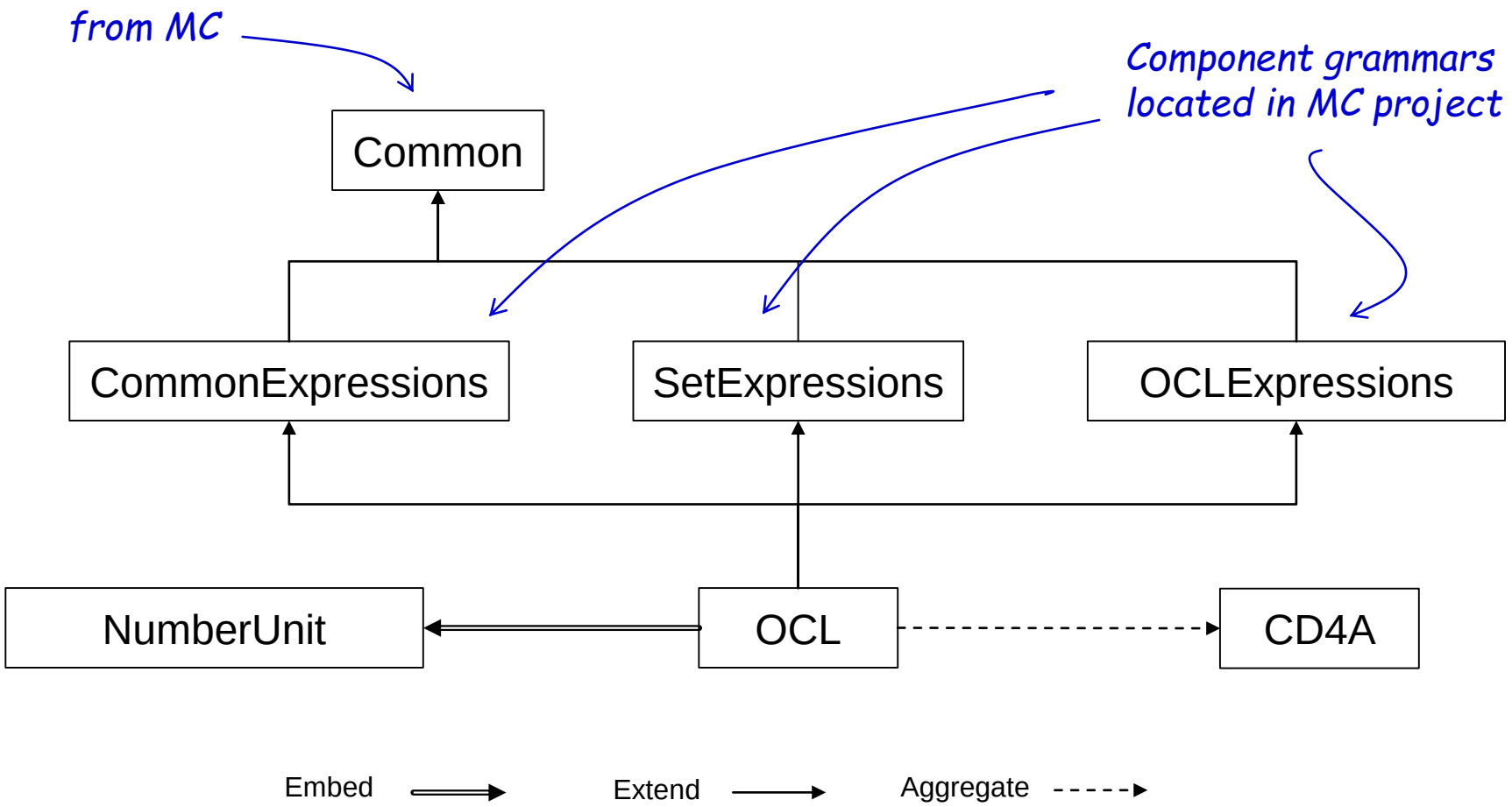
- Can be found in: github:
  - https://github.com/MontiCore/OCL

- Open accessible: Yes
- MC version: 5.0
- Uses: CD4A, NumberUnit

- Current state:
  - Rather stable
  - Next focus: Maybe rework Symbols and Scopes

Language Composition

- Language extensions overview:



Algorithms and Functionallity

- OCLCDTool.java
  - CLI Tool
  - Can load OCL and CD model and provide parse errors
  - Can load OCL and CD model and provide type errors (using type-checking functionallity)
  - Can load CD model an print to plantUML combatible format to visualize (using CD4A2PlantUML printer)

- OCLCDToolTest.java
  - Tests parsing and checking with models as String or File

Algorithms and Functionallity

- CD4A2PlantUmlVisitor.java
  - Uses visitor pattern
  - Build a plantUML compatible string for visualization from CD AST
  - With options to show/hide:
    - Attributes
    - Assocciations
    - Roles
    - Cardinalities

- CD4A2PlantUmlTest.java
  - Tests above mentioned features

Algorithms and Functionallity

- Type-checking
  - OCLSymbolTableCreator.java
  - OCLVariableDeclarationSymbol.java
  - OCLExpressionTypeInferingVisitor.java
  - OCLTypeCheckingVisitor.java
  - TypeInferringHelper.java

Type Checking

- OCLSymbolTableCreator
  - builds the symboltable
  - adds types to OCLVariableDeclarationSymbol
  - Infers types from expression if needed (OCLExpressionTypeInferingVisitor)

  - Also see Docu.OCL.Type.Checking.ppt

Type Checking

- OCLTypeCheckingVisitor
  - Uses visitor pattern
  - Checks if expressions use compatable types, e.g. infix expressions have matching types on each side
  - Is called bei CoCo
  - Uses OCLExpressionTypeInferingVisitor

  - CoCos test: TypesCorrectInExpressionsTest

Type Checking

- OCLExpressionTypeInferingVisitor
  - Uses visitor pattern
  - Infers type from Expression
  - Uses:
    - OCL AST
    - OCL Symboltable to get OCLVariableSymbol
    - CD Symboltable to navigate along types
    - TypeInferringHelper
  - Tested at OCLTypeInferringTest

Type Checking

- TypeInferringHelper
  - Provides helper functions
  - Flattening logic is here (Set<Set<x>> to Set<x>)