Topic 06: Xtext of Eclipse Text Modeling Framework

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Abstract

Process of compiler developing takes a lot of time. We can simplify it using existing frameworks, libraries, development tools, etc. Moreover it is desirable to use techniques, which produce compilers without dependency on specific platform. One option of platform-independent framework is Xtext.

Xtext is a framework for creation of domain specific languages (DSL) or general purpose programming languages. Using Xtext we are also able to add missing development environment for already existing language. Xtext allows us to create an Eclipse-based development environment in a short amount of time. Infrastructure of Xtext based language itself runs on the Java Virtual Machine (JVM), which makes compiler components naturally platform-independent. Components of the compiler include: the parser, the type-safe abstract syntax tree (AST), the serializer, the code formatter, the linking and scoping framework, compiler checks and validation, the code generator and interpreter.

The presentation covers the main aspects of Xtext. There are introduced languages such as Xtend, Xtext and MWE2 to describe our programming language and compiler. It focuses on process of writing compiler in Eclipse IDE. Presentation demonstrates creation of grammar of simple DSL. Also it is shown how Xtext generates a model for domain specific grammar, and how this model is transformed to Java classes using Eclipse Modeling Framework (EMF). Xtext generates also templates for the code generator, the validator, the formatter, etc. It is demonstrated how to complete templates using Xtend language. In addition to writing simple DSL, we focus on grammar specifying for expressions.

Bibliography:

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