Error Reporting for Universe Types with Transfer: Project Description

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Introduction

The Universe type system is a static type system which allows a programmer to express ownership relations between objects. An enhanced version of this type system, which also allows ownership of objects to be transferred, is implemented in the MultiJava compiler. It turns out, however, that when program errors related to the universe type system happen, it is difficult to figure out what the cause of such an error is, because the compiler's error messages are lacking. This is not an oversight of the compiler authors, as it is non-trivial to present good error messages.

Main Goals

The main goals of this diploma thesis are:

- For violations of universe type system contracts, to find algorithms that produce a clear explanation of why the program is wrong, and what circumstances led to the violation. Such an explanation might look similar to a classic backtrace.

- To implement these algorithms in the MultiJava compiler, and to complement them with examples and tests.

Possible Extensions

If time permits, the following extensions will be considered:

- Definition and implementation of a new **lent** keyword. This keyword shall express temporary changes of ownership for the duration of one method.

- To consider whether a purity variant that applies to ownership only would be useful, and if yes, to implement it.

- To restructure and clean up the MultiJava architecture and code.

Administrative Details

This diploma thesis will be written between January 8, 2008 and May 7, 2008. It will be supervised by Prof. Dr. Peter Müller and Arsenii Rudich of the ETH Zurich.