

Implementation of a Universe type checker in ESC/Java2

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Introduction

The Software Component Technology group has developed the Universe type system. It is an extension to the Java type system that allows the programmer to perform aliasing and dependency control in a flexible way.

The Universe type system is an ownership type system which allows one to express a hierarchical partitioning of the object store into so-called universes. Type checking enforces referencing constraints between objects in different universes. The Universe type system provides support for preventing representation exposure. It is easy to apply and guarantees an invariant that is strong enough for modular verification.

The Extended Static Checker for Java (ESC/Java) is a compile-time program checker that finds common programming errors. The checker is powered by verification-condition generation and automatic theorem proving techniques. The current version 2 works with JML annotations.

Goal

The goal of this semester project is to integrate the Universe type system into ESC/Java 2. The source code of ESC/Java 2 has to be analyzed and ways to extend the type checking need to be found. It is not part of this project to integrate the Universe type system into the logical framework of ESC/Java2.