Bright: A Secure Internet Programming Language

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Chapter 1

Introduction

In this project, I will designed and implemented a programming language, Bright, designated to secure Internet computations as an extension of Java. I will pay particular attention to scalability, interoperability, efficiency, and the principled interaction of security policies with containment mechanisms.

1.1 Background

At the present, the Internet is part of daily life. It is immpossible to seperate people from Internet. During the past two decades, the demands for high-performance secure Internet computations have been pushing various new programming languages, production compilers, and sophisticated security policies, such as Java, C#, etc. Although these programming languages are very successful in commercial, they still have many of the deficiencies need to improve.

In order to help Internet programmers create more reliable and secure component software systems, I present Bright, as a small extension trial, to improve Java's security performance.

1.2 Stratages

Bright is an intuitive, object-oriented, portable, and highly secure language and services as an extention of Java with high level safety policies.

1.2.1 Intuitive

The language will be simple and quick-to-start. Basic and necessary language features would be included in the language specification.

1.2.2 Portable

The language will run on various platforms. For portability I will use ANTLR as the syntax recognizer, which is running on a Java virtual machine(JVM). The current version of the language will be interpreted and executed, by a pure java interpreter. With the help of the portability of Java programming language, Bright can be virtually run on any machine.

1.2.3 Object-oriented

By supporting the concept of object, all components are designed to be objects with data and interface.

1.2.4 High Level Secure

Brigh will handle not only safety policies such as all memory accesses are in the valid region, but also full-fledged security policies, which is every access to resource X has a proper chain of authorization. This will allow the principled interaction of mobile code containment with the enforcement of higher-level security properties.