

LogicFence: A framework for enforcing global integrity constraints at run-time

Abstract

Semantic constraints on global properties of a system are rarely identified and incorporated into the design of components. For instance, a given ATM card with a given signature cannot be inserted in two different ATMs at the same time. Such kinds of global constraints are difficult to discern and incorporate into the design of individual software components. Global constraints may change over time and their enforcements may depend upon the local states of individual components. LogicFence is a framework which accepts a definition of global constraints written in a specified constraint model. It then translates these constraints into primitives that are embedded into the run-time of application programs (currently, into the JVM of Java applications). Once here, LogicFence monitors the state of application programs and prevents disparate instances to collectively form a globally inconsistent state.