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SIMPLE: A PROTOTYPE SOFTWARE FAULT-INJECTION TOOL

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Fault-injection techniques can be used to methodically assess the degree of fault tolerance afforded by a system. In this thesis, a Java-based, semi-automatic fault-injection test harness, called Software Fault Injection Mechanized Prototype Lightweight Engine (SIMPLE) is introduced. SIMPLE employs a state-based fault injection approach designed to validate test suites. It also can assist developers to assess properties of a system such as robustness, reliability, and performance. Furthermore, SIMPLE employs fault acceleration to test a system's fault-tolerant capabilities. An object-oriented analysis of the system and several case studies, using software fault injection on specific, targeted systems, to assess SIMPLE's effectiveness is presented.

KEYWORDS: Software Fault Injection, Fault Tolerance, Software Testing, Software Test Coverage, and Metrics