

Formal Analysis of Jackrabbit Software Using Java PathFinder

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Software is getting more and more complicated these days and software engineers need new techniques to improve the quality of their systems. Model checking might be a good technique to assist software engineers in finding problems, but is only slowly being adopted by companies. In this research we looked at the possibility of using model checking technique on business applications to reduce the number of concurrency problems. For this we used Java PathFinder (JPF), a model checking tool that checks Java byte code.

The research consisted of two parts. In the first part we looked at the use of JPF for verifying software, in our case Jackrabbit. Although we were able to use the model checker on Jackrabbit, we did not find the documented concurrency problems we hoped to find. We were able to make some small improvements on JPF concerning the memory usage. One component was improved to make the tool less memory consuming. We were also able to estimate the expected maximum memory needed to run our models.

In the second part we looked at the perceived usefulness and ease of use of JPF. We sent out a survey to Java PathFinder users to see how useful and easy to use the tool is. Java PathFinder received a neutral assessment and three such features that would improve the tool were found.