

## Abstract

Performance of a Java Virtual Machine (JVM) is quantified in terms of the JVM's relative CPU availability at executing concurrent Java threads. The total CPU loading of a JVM is defined by the sum of the CPU utilization factors of all threads executing on the JVM. Sharp performance degradation has been observed while JVM executes concurrent threads with exactly same CPU load. An analytical model has been proposed and implemented to improve the scenario. Extensive experimental studies and statistical analysis are performed to validate the performance enhancement of concurrent thread execution and provide a basis for an empirical model for improving CPU performance. To facilitate scientific and controlled empirical evaluation, synthetically generated threads are employed that are parameterized by their CPU utilization factor, which is defined as the fraction of time a thread spends utilizing CPU resources