A Comparative Performance Study of Procedural Rule Evaluation vs Rete-Based Drools Engine at Enterprise Level

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Abstract

This case study presents a controlled experimental comparison between a custom procedural pricing engine and a Rete-based rule engine (Drools) under high-volume policy evaluation workloads at enterprise level. Using JMH-based micro benchmarking on an Intel i5-12700H system (16GB RAM, JDK 17), we evaluated performance across rule sets ranging from 50 to 500 insurance rules and policy volumes of 100,000 and 500,000 records.

Results demonstrate that procedural insurance rule evaluation exhibits near-linear scaling with respect to rule count and maintains throughput stability across increasing policy volumes. However, Drools incurs significant overhead for flat rule sets due to Rete network construction and fact propagation costs. The findings highlight architectural trade-offs between deterministic procedural engines and declarative rule-based systems in high-throughput environments.

Keywords

JMH (Java Microbenchmark Harness), RAM (Random Access Memory), BRMS (Business Rule Management System), JDK (Java Development Kit), DRL (Drools Rule language).