

**Applying OWL 2 RL Rule-Based Reasoning in  
Multiple Computing Environments**

By

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## **ABSTRACT**

The OWL 2 RL profile is a Semantic Web standard for which implementations can use to perform deterministic and polynomial-time reasoning. Reasoning plays a vital role in the Semantic Web and as result there is a lot of interest in finding implementations that can perform well under heavy data loads. The focus of this paper is to create a suite of implementations that exercise the OWL 2 RL standard in various computing environments. Specifically, attention is given to implementations that can scale to large datasets containing millions of triples for which the underlying reasoning process must perform within a satisfactory time.

An evaluation is performed on the implementations subjected them to varying configurations of their environments. It was shown that a distributed model fails to scale in comparison to its sequential and parallel counterparts. More observations are made to note possible bottlenecks that may arise during the reasoning process for all the implementations.