Communications Directed by Bound Types in Linda: presentation and formal model

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Abstract—

Linda is an elegant parallel and distributed programming model. It is based on a shared associative memory, structured in tuples. We show in this paper that this model suffers from the false matching phenomenon. We explain under which conditions this problem occurs, we examine the solutions already proposed to solve it, and we show why they are not sufficient.

In this framework, our goal is to propose an extension to the Linda model in order to eliminate the false matching phenomenon. This model –called B-Linda–, suitable for modern programming paradigms, adds an extended-type notion into the basic Linda model. It is first introduced in an informal manner, then we present an implementation of it. Some formal aspects are specified in the appendix: definition of the model's elements, and operational semantics.

Keywords—

Asynchronous Parallelism, Distributed Shared Memory, Linda Model, Distributed Application, Type, Directed Communication, False Matching, Type Scope.

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