

Declarative Networking: CALM Conjecture and Consistency Decidability

Tom J. Ameloot*

Hasselt University & Transnational University of Limburg

1 Abstract

Declarative networking is a field in which people implement distributed protocols and applications in high-level declarative languages like Datalog. Such a declarative formalism is believed to help the programmer express complex distributed computations with relatively few lines of code.

In the first part of the talk, we present our research on the CALM conjecture by Hellerstein [3]. This conjecture relates distributed coordination to the monotonicity of the overall computation. We have shown [1] that in a certain model of distributed computation, formalized with networked relational transducers, the distributed program can proceed without coordination if and only if it is monotone.

We call a distributed program consistent if it computes the same result regardless of network delays on messages. If time allows, in the second part of the talk, we present our research on deciding consistency of a distributed program. Still in the setting of networked relational transducers, we obtain a decidability result for programs implemented with restricted conjunctive queries [2].

References

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