SAGA: Towards a Comprehensive Distributed Programming System

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Introduction

Large-scale distributed systems and applications have been the primary workhorse for the computational sciences for more than two decades now. Originally rooted in the 1960s operating system research [1], distributed computing quickly became one of the most popular and exciting area of both, theoretical and applied computer science research and climaxed, at least in terms of popularity, with the conceptualization and implementation of the World Wide Web in the early 1990s.

Today, the fundamental concepts of how to compose portable, reliable, fault-tolerant and scalable distributed systems are very well understood and an important part of any modern computer science and informatics curriculum. Yet, especially the scientific community still struggles to develop and deploy scientific applications that implement these very characteristics. Why? Wouldn't one expect distributed computing to have matured progressively from the theoretical concepts to powerful abstractions? From distributed mutual exclusion techniques to to communication patterns, to powerful and transparent application frameworks?

References

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