How does PGAS collaborate with MPI+X?

Mitsuhisa Sato*

November 13, 2017

Abstract

While MPI is commonly used as a programming model between nodes for large-scale distributed memory systems, new programming models such as PGAS are emerging for many core and new communication models. PGAS is expected to be one of the programming models for exascale computing due to light-weight one-sided communication and low overhead synchronization semantics. While it is reported that PGAS can take advantage of its programming model in some applications, in reality, PGAS programming systems have several problems in performance and run-time design as a general-purpose communication layer. And, only one-side communication by PGAS is not sufficient to implement whole parallel applications so that it needs to cooperate with high-level global operations such as MPI collective communications. We are developing a PGAS programming language XcalableMP including coarray extension. In this talk, I will discuss the present status of PGAS and its future direction with respect to current dominant programming model MPI+X, and our experience of PGAS application development will be also addressed.

*Team Leader, Programming Environment Research Team Deputy Project Leader and Team Leader, Architecture Development Team, Flagship 2020 Project Advanced Institute for Computational Science, RIKEN