SORS: Alternative Programming Paradigms - Distributed Tasking with PaRSEC

Objectives

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Abstract:

Message-passing programming models have dominated high-performance computing (HPC) for the past quarter century. With the continued breakdown of the (uniform) sequential processors abstract machine model, many researchers have questioned the continued viability of message passing as a model for direct, application-level interaction. Recent years have seen an explosion of new paradigms in programming models for distributed-memory computing. The move to the next generation of HPC platforms presents a wider variety of challenges than ever before, including the increased need for asynchrony, increased hardware diversity and performance non-uniformity, decreased hardware reliability and increased failure rates, but also the maintainability of increasingly complex scientific code bases.

This talk presents our motivation, as well as ongoing efforts to solve two challenging and interdependent problems facing the HPC developer community: how we create an execution model that enables developers to express as much parallelism as possible in their applications, and how to ensure that that execution model is flexible and portable enough to actually increase the scientific productivity of those same application developers. This talk focus on the PaRSEC runtime, the underlying distributed task-based scheduler, and few of it's Domain Specific Languages and Extensions providing developers with high productivity, efficiency and programmability.

Short bio:

George Bosilca is an Assistant Research Professor at the Innovative Computing Laboratory at University of Tennessee, Knoxville. His research interests evolve around designing support for parallel applications to maximize their efficiency, scalability, heterogeneity and resiliency at any scale and in any settings. He is actively involved in projects such as Open MPI, ULFM, PaRSEC, DPLASMA, TESSE.

Speakers

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