

Experiences with UPC at Scale

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Unified Parallel C (UPC) belongs to the family of Partitioned Global Address Space (PGAS) languages, together with Co-Array Fortran, Titanium and X10. PGAS languages rely on one sided-communication primitives that exploit network RDMA support and present to the user level a logically partitioned address space. In this talk I will describe our experiences with UPC at scale and the performance benefits of one-sided communication, as well as the extensions required, possible solutions and the associated implementation challenges when targeting clusters of multicore processors. I will discuss the extensions required to support executions with both processes and pthreads and the extensions required to support hybrid programming: SPMD + dynamic task parallelism/OpenMP.