Zoltan2 task placement decreases application communication costs on LCF platforms
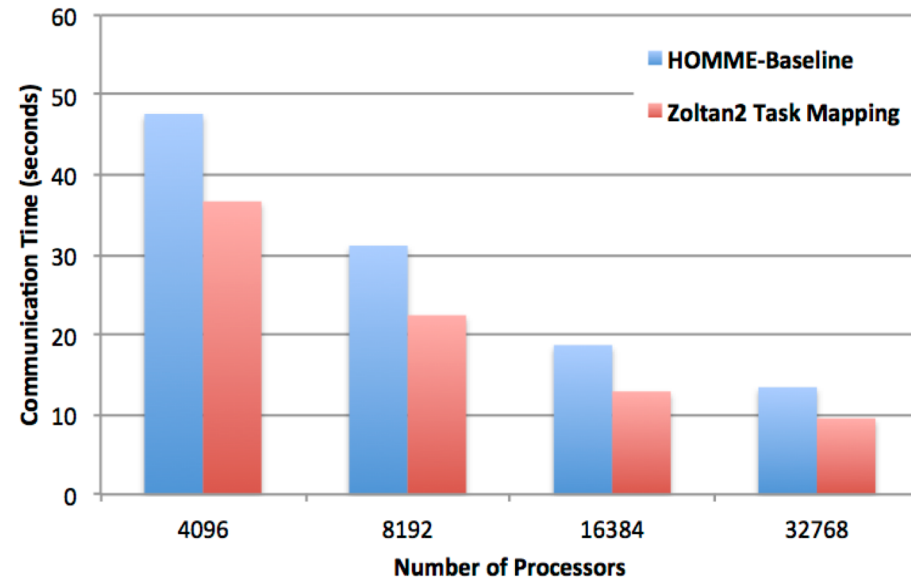
Scientific Achievement

Architecture-aware task placement algorithms in Zoltan2 reduce application communication costs on several Leadership Class platforms

Significance and Impact

Reducing applications' communication costs decreases turn-around time for scientific simulations such as atmospheric modeling, while more efficiently utilizing LCF resources

Zoltan2 task placement reduces communication time in the E3SM HOMME atmospheric modeling code up to 31% on ANL's Mira

Details

Zoltan2's task placement algorithms exploit geometric partitioning strategies to place interdependent tasks in "nearby" cores within the computing network. Thus, applications' messages travel shorter distances in the network and network contention is reduced.

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