Will MPI Remain Relevant?

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While the Message Passing Interface (MPI) is the ubiquitous standard used by parallel applications to satisfy their data movement and process control needs, the over-arching domination of MPI is no longer a certainty. Drastic changes in computer architecture over the last several years, together with a decrease in overall reliability due to an increase in fault probability, will have a lasting effect on how we write portable and efficient parallel applications for future environments. The significant increase in the number of cores, memory hierarchies, relative cost of data transfers, and delocalization of computations to additional hardware, requires programming paradigms that are more dynamic and more portable than what we use today. The MPI 3.0 effort addresses some of these challenges, but other contenders with latent potential exist, quickly flattening the gaps between performance and portability.