An Automated MPI ISend Optimization

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The fields of science and engineering are becoming increasingly dependent upon High Performance Computing, or HPC, to make complex calculations that are infeasible on desktop computers due to their memory constraints and inability to complete the number of calculations required in a convenient amount of time. One of the most commonly used tools in this arena is MPI, or Message Passing Interface. We are developing a tool that will automatically optimize a common inefficiency in MPI programs.

By replacing blocking sends with asynchronous sends, more work can be done on a process while waiting for the communication to complete. This will allow HPC users to accomplish more computing per expensive cluster timeslice.