CSCI 6360: Parallel Computing/Programming Assignment #3:Point-2-Point Reduction vs. Collective Reduction

Assignment Report

Manqing Ma, 661963918
mam6@rpi.edu

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Environment: AMOS Blue Gene/Q,
Debug: gcc, mpi-gnu, mpi-xl,
Run: mpi-xl
Execution time: 7:30AM, 3/14/2019

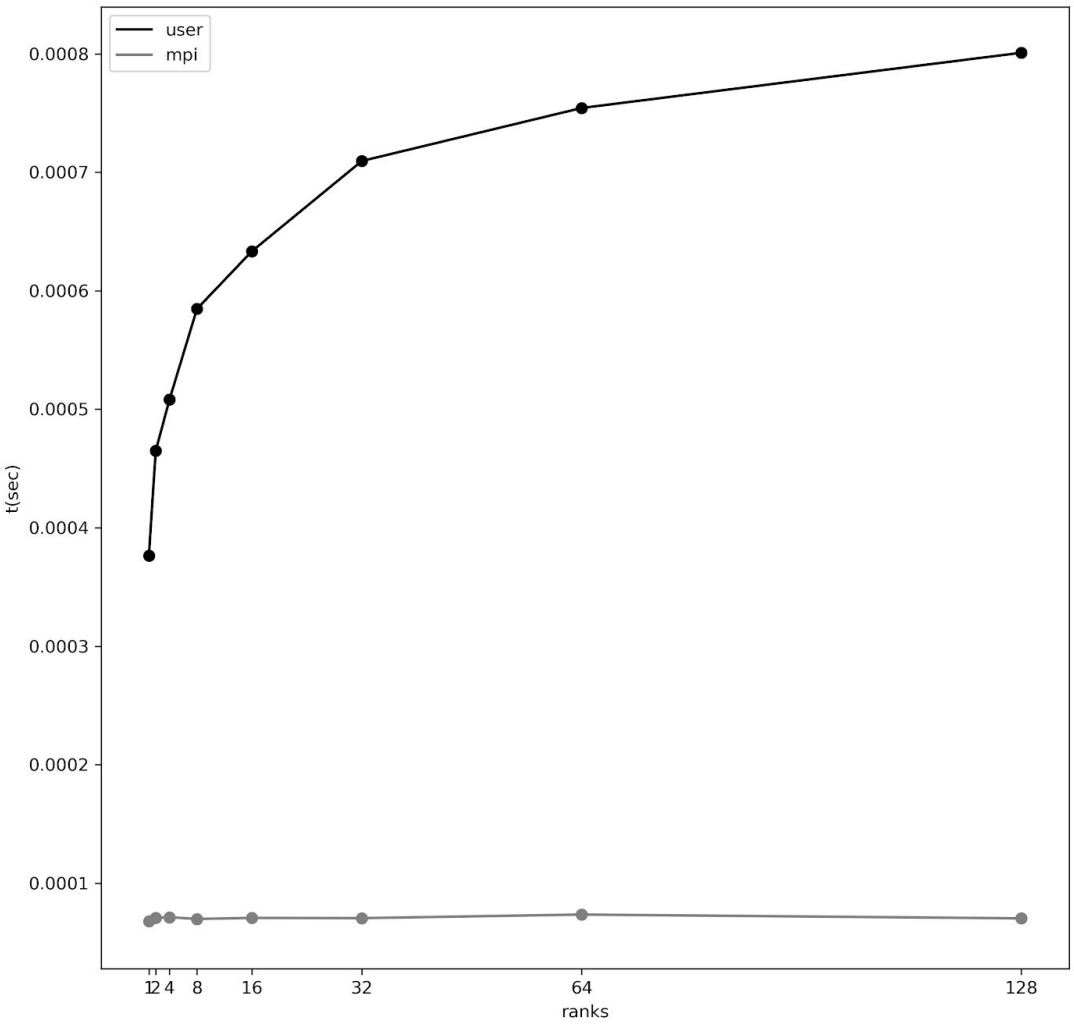

Figure 1. Comparison between the user implemented “MPI_P2P_reduce” and the MPI built-in “MPI_Reduce”

Comments:

- Overall, the MPI's reduce function performs ~10 times faster than the user's implementation on MPI_SUM
- The MPI's reduce function behaves more stable when the number of ranks gets larger. Showing its robustness to large communicator pool.
- The user's implementation suffers from high communication costs between ranks and runs longer when the number of ranks increases. The increasing follows a logarithm fashion.