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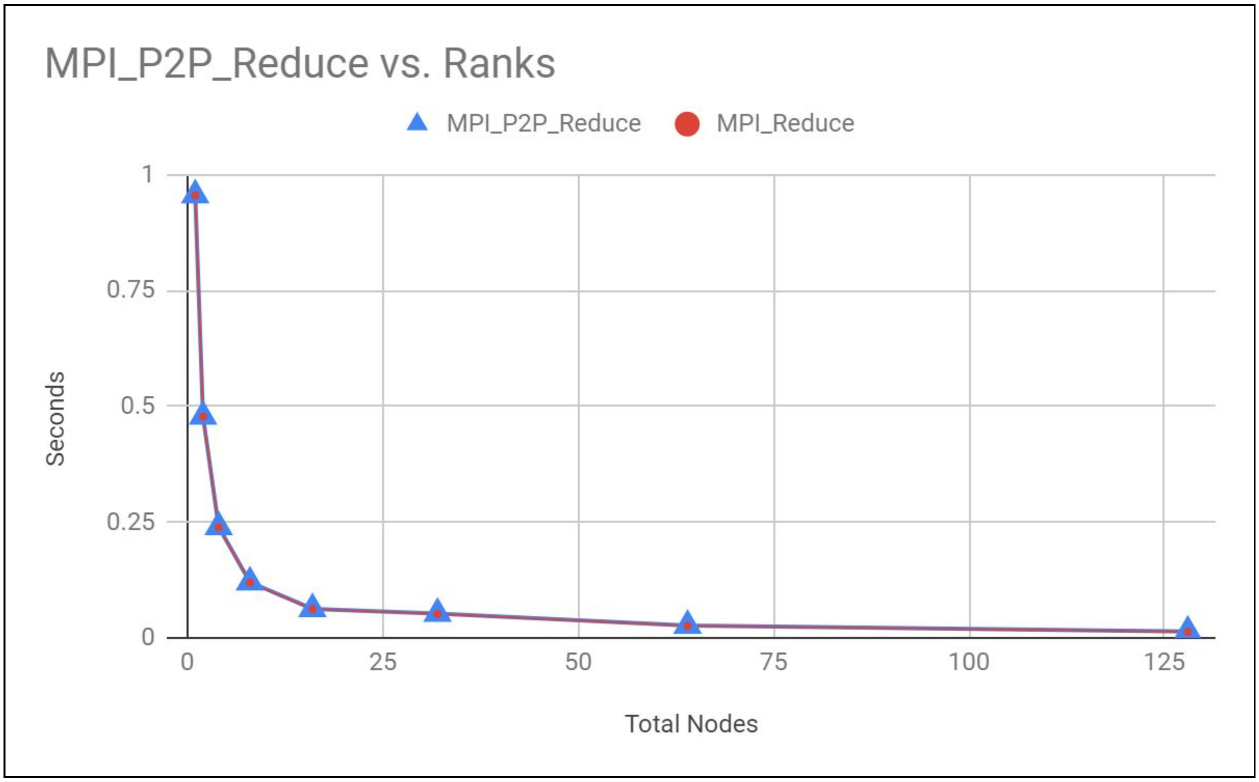
10Mar2019
Parallel Computing HW 3: MPI_P2P_Reduce

With doubling amounts of nodes used to add together a consistent number of values, our runtime speed ups are what we expected, halving with each increase in nodes used. The entire timed part of our function, adding a 1/n-th portion of our input array, where n is the number of ranks available, followed by sending these values, scaled with these node increases, explaining this run-time relationship for MPI_P2P_Reduce. In comparing these run times with MPI's given MPI_Reduce function it is easy to see we got very similar run times, though the MPI_Reduce runtimes were slightly faster, usually around 0.001 seconds, suggesting there may be some other additional minor optimizations implemented by MPI_Reduce.



Fg 1: Line Graph of Run Times

Final Data:

BG/Q Nodes (Total Ranks)	MPI_P2P_Reduce	MPI_Reduce

1 (64)	0.955931	0.955327
2 (128)	0.478308	0.477726
4 (256)	0.239497	0.238886
8 (512)	0.120147	0.119485
16 (1024)	0.062728	0.061925
32 (2048)	0.052577	0.051623
64 (4096)	0.026890	0.025884
128 (8192)	0.014043	0.013017