

CMPE 478 Parallel Processing, Spring 2007
Homework 2 (due May 11th)

Implement Parallel Sorting by Regular Sampling method using MPI. Prepare 4 different versions based on how you implement the last communication phase of the algorithm (i.e. communication of sorted sublists to the responsible processor). The 4 different versions are as follows:

1. Use MPIAlltoAll to communicate the sizes and senders of the sublists and MPIAlltoAllv to communicate the sublists.
2. Use MPIAllReduce to communicate the sizes and senders of the sublists and MPIAlltoAllv to communicate the sublists.
3. Use MPIAllReduce to communicate the sizes and senders of the sublists and non-blocking send/rcv calls to communicate the sublists.
4. Use RMA (get/put) operations to communicate the samples, the sizes and senders of the sublists and non-blocking send/rcv calls to communicate the sublists.

You should run your implementation on up to as many processors as possible (e.g. $P=1..64$ will be nice). Then for each version, plot P vs. Time with multiple curves for increasing number of keys (e.g. 1M, 2M, 4M, 8M and 16M keys *per* processor). An example of what your plot may look like is given below.



