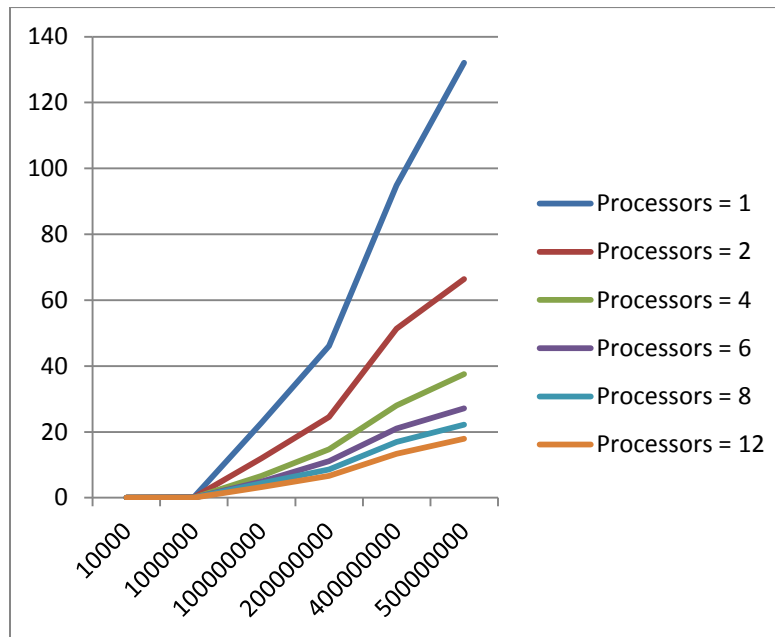


CMPS 297M – Parallel Computing
Parallel MergeSort in CILK, OpenMP, MPI, and Hybrid
Kinan Dak Al Bab – kmd14
15/04/2014

Clarifications:

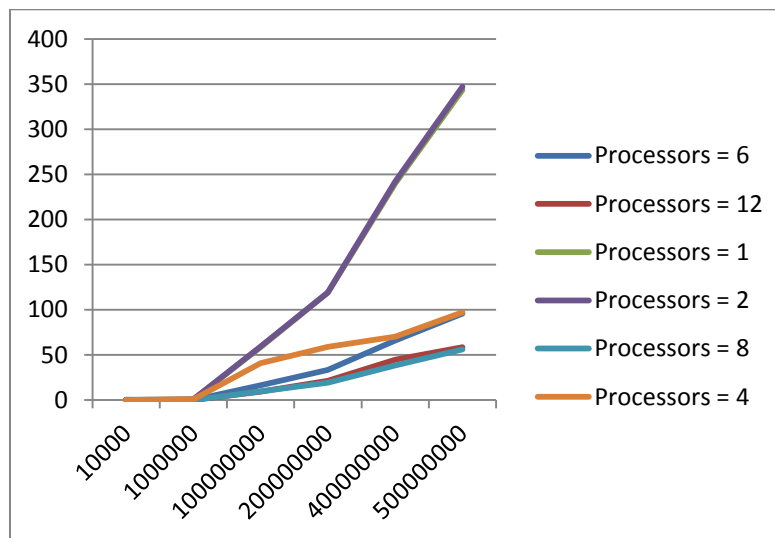
- I- Input size used are: 10000 100000 1000000 5000000 10000000 50000000 elements.
- II- All times stated are measured in seconds.
- III- Detailed Graphs are found under rootdirectory/plots

CILK:



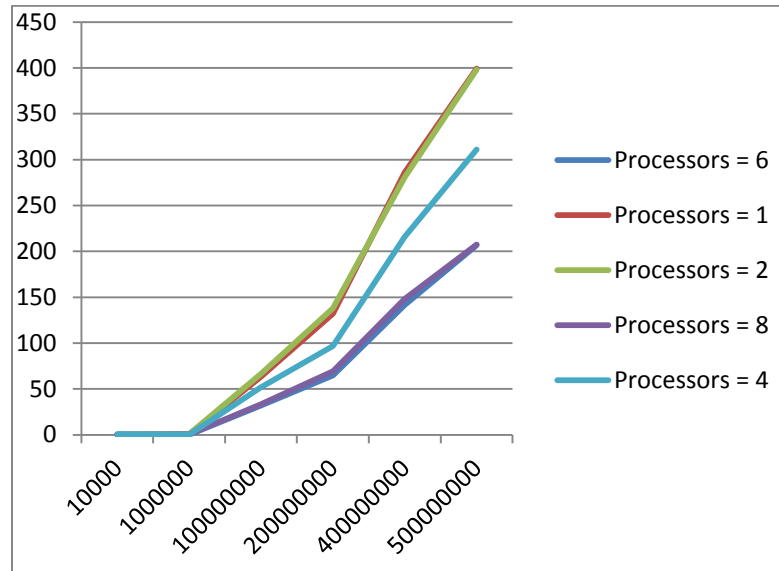
- Each time we increase the number of processors we get a speed up. CILK scales for increasing processors, and for input sizes.

OpenMP:



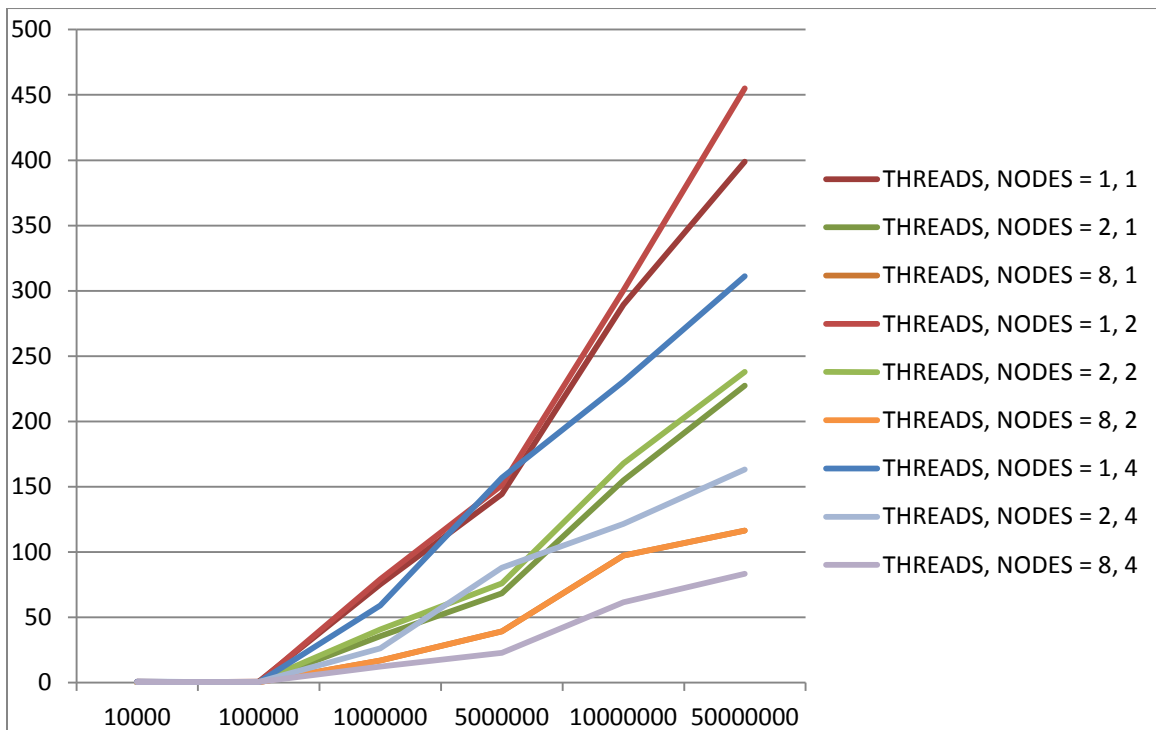
- OpenMP takes more time to sort the same amount of elements, it is notably slower than CILK, Also the speedup we get when we increase the processors is very small, and when we increase the number from 8 to 12 we get a small slow down sometimes, doesn't scale. That is most clear by observing the cases of 1 and 2 processors, they take nearly the same time, overhead to add a new processor is equal to the speed up in a sense.

MPI:



- MPI takes the most amount of time to sort, having 1 or 2 processor is the same, also changing processors from 6 to 8 gives us a slow-down, due to the volume of messaging the MPI being a distributed paradigm.

Hybrid:



- In Hybrid, Both increasing THREADS and NODES will give us speedup, however increasing THREADS gives a more significant and clearer Speedup then NODES, also both don't scale, after increasing THREADS or NODES to a certain limit (6 or 8) we stop getting speedups.