Concurrency & Parallel Programming

MPI

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1 Assignment 2.1 - Wave simulation

1.1 Table with results

Tests on DAS4 are run for i = 1.000.000 and t = 1.000. Measurements are done with 8 nodes and 1 process on each node. 1 node with 8 processes on the node. And finally 8 nodes with 8 processes each. Each measurement is run 12 times. The highest value and the lowest value are disregarded.

i = 1,000,000		t = 1,000
1 node with 8 processes	8 nodes with 1 proces each	8 nodes with 8 processes each
~~1.72071~~	0.499236	0.119181
1.22258	0.495219	~~0.116725~~
1.38375	~~0.495014~~	0.119682
0.851386	0.49582	0.121414
0.932281	0.495152	0.119064
1.02867	0.495158	0.119373
1.31722	0.49516	0.119355
1.39341	0.495073	0.121163
1.16325	~~0.499252~~	0.1189
~~0.696113~~	0.495062	0.120271
1.40915	0.495312	0.123
1.16556	0.495146	~~0.12473~~
Average of the remaining 10:		
1.1867257	0.4956338	0.1201403

1.2 Comparison to pThreads

If the results using MPI are compared to results using pThreads we can see clearly that MPI is quicker when more nodes are used (and a same amount of cores as with pThreads), as seen in the table below. This is the best possible comparison, because both methods use 8 cores to calculate the wave. The only big difference, besides the difference in MPI and pthreads, is that the MPI method makes use of more then 1 node. We can conclude that MPI shows more potential to get better speed results then pThreads.

Average with a total of 8 processes		
1 node, 8 processes	8 nodes, 1 process each	8 pThreads
1.1867257	0.4956338	0.6777506

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