Concurrency & Parallel Programming

OMP

Auteurs: Tom Peerdeman & René Aparicio Saez

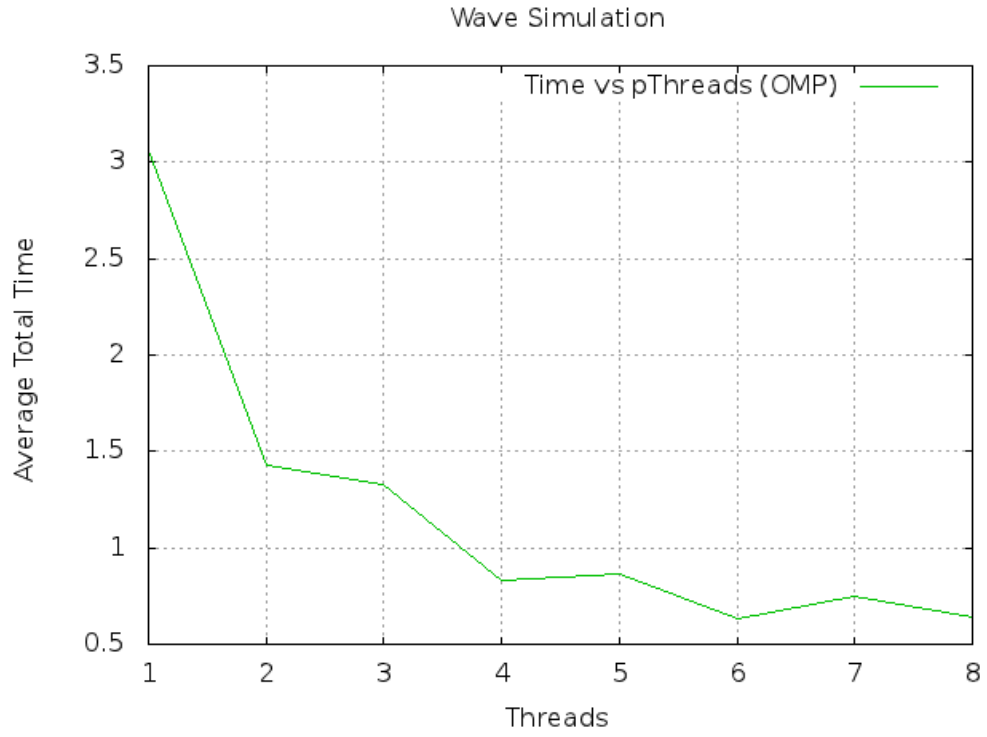
Datum: 19-11-2012

1 Assignment 1.1 - Wave simulation

1.1 Table with results

Tests on DAS4 are run for i_max = 1.000.000 and t_max = 1.000. The amount of omp threads used to generate the waves is increased to measure the difference in speed for the program. Each amount of threads is run 12 times. The highest value and the lowest value are disregarded. The remaining data is used to plot a graph. These tests are done without specifying scheduling, this is done later in the report.

i = 1,000,000				t = 1,000			
~~3.1211~~	1.43211	1.26944	0.939188	0.851557	0.623673	0.718125	0.677228
3.04543	1.42686	1.29452	0.813184	0.873015	0.654943	0.756256	~~0.587986~~
~~3.02998~~	~~1.40477~~	1.33823	0.813059	0.848276	~~0.593785~~	0.740096	~~0.694887~~
3.0661	1.4104	1.45341	0.772554	0.878858	0.670092	0.720322	0.631909
3.06365	1.41057	~~1.68411~~	0.814582	~~0.988416~~	0.630324	0.736533	0.664366
3.08719	1.42461	1.30602	~~0.939831~~	~~0.828244~~	0.621332	~~0.716592~~	0.663344
3.08742	~~2.20822~~	1.27907	0.802773	0.91554	0.628798	0.816578	0.622237
3.04847	1.41933	1.30155	0.837648	0.854704	0.617878	0.833466	0.601991
3.06515	1.44256	1.45228	0.913682	0.839151	~~0.708951~~	~~0.845428~~	0.677083
3.04467	1.42778	1.29303	~~0.771725~~	0.845102	0.66214	0.731911	0.615128
3.03383	1.44278	1.32129	0.825917	0.868847	0.666777	0.736191	0.592873
3.07641	1.43763	~~1.26484~~	0.778603	0.89026	0.571218	0.73283	0.659633
Average of the remaining 10:							
3.061832	1.424268	1.330884	0.8311174	0.8664933	0.6306423	0.7523437	0.6399728



Apparantly the performance is better if an even number of threads is used.

Tom Peerdeman - 10266186 René Aparicio Saéz - 10214054

1.2 Comparison between schedulers

OpenMP has three different types of schedulers. Below are the results of the different schedulers to calculate the wave equations. If no scheduler is specified, 'static' is the standard scheduler. Just in case, new tests are run specifying 'static' as scheduler. The tests where run using i_max = 1,000,000 and t_max = 1,000.

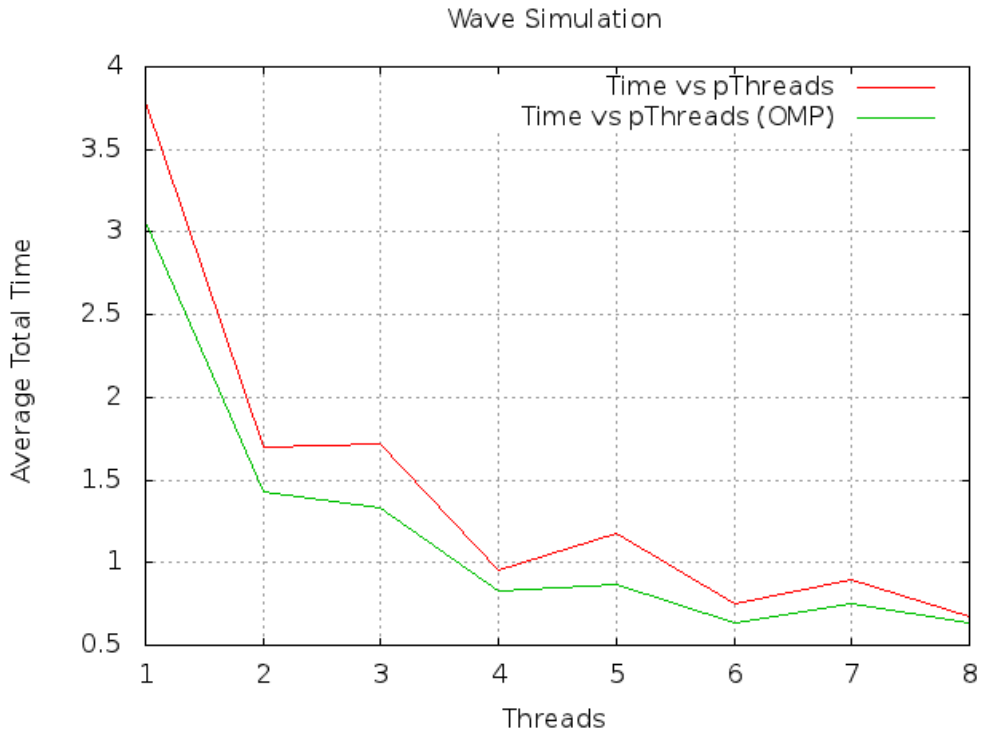
guided, 1	dynamic, $\frac{i\_max}{num\_threads}$	static, $\frac{i\_max}{num\_threads}$
1.34428	1.29205	0.639236
1.33937	1.34629	0.652469
1.35234	1.32758	0.646157
1.33636	1.2953	0.638384
1.30415	1.33798	0.681617
1.3897	1.34237	0.69578
1.37503	1.20245	0.650952
1.33084	1.24136	0.685962
Average of the runs:		
1.35120375	1.31465	0.661319625

Tests using the 'guided' scheduler, but with a bigger smallest chunk resulted in slower preformance or equal preformance. The best scheduler for this equation is the 'static' scheduler.

1.3 Comparison to normal pThreads

When comparing the results, it becomes clear that OMP (without any specified scheduler) is faster then the usual pThread parallelisation method.

Average of 10 runs:								
	1 thread	2 threads	3 threads	4 threads	5 threads	6 threads	7 threads	8 threads
pThreads	3.788914	1.701978	1.713576	0.9564147	1.173655	0.7479494	0.89525656	0.6777506
OMP	3.061832	1.424268	1.330884	0.8311174	0.8664933	0.6306423	0.7523437	0.6399728



Tom Peerdeman - 10266186 René Aparicio Saéz - 10214054