Overview

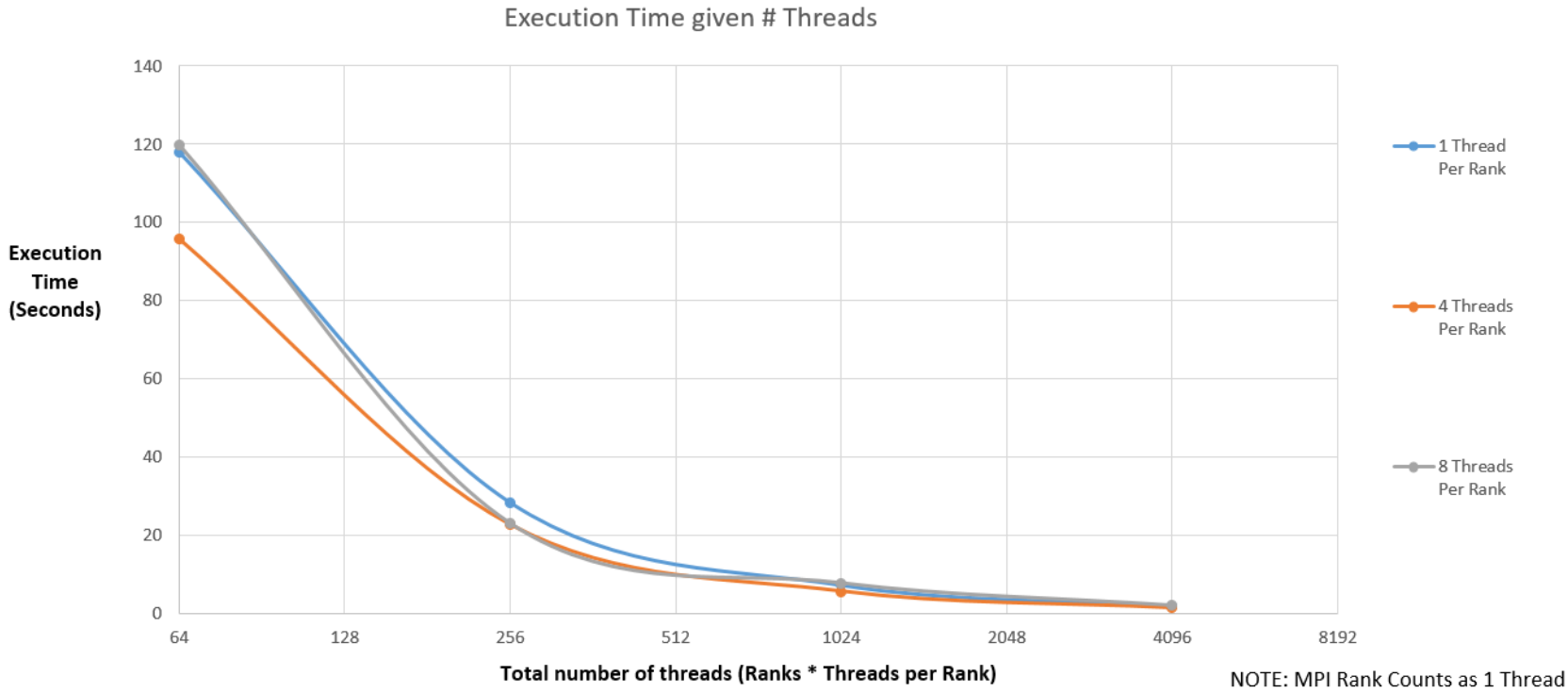
Experiment => The following tests with 1, 4, 16, 64 computer nodes:

- 8192x8192 cell universe using 64 MPI ranks per node, no additional Pthreads besides the rank itself, for 100 ticks with a threshold of 25%.
- 8192x8192 cell universe using 16 MPI ranks per node, 4 Pthreads per Rank for 100 ticks with a threshold of 25%. (Rank counts as 1 Pthread, 3 additional Pthreads are spawned per rank)
- 8192x8192 cell universe using 8 MPI ranks per node, 8 Pthreads per Rank for 100 ticks with a threshold of 25%. (Rank counts as 1 Pthread, 5 additional Pthreads are spawned per rank)

Performance Results

Nodes	Ranks	Threads per Rank	Total Threads	Time	Speedup	Thread Efficiency (Speedup / Total Threads)	Efficiency (Speedup / Ranks)
1	8	8	64	119.802602	1	0.015625	0.125
1	16	4	64	95.784341	1.250753523	0.019543024	0.078172
1	64	1	64	117.892507	1.016202005	0.015878156	0.015878
4	32	8	256	23.022912	5.203625067	0.02032666	0.162613
4	64	4	256	22.744539	5.267312826	0.020575441	0.082302
4	256	1	256	28.391889	4.219606593	0.016482838	0.016483
16	128	8	1024	7.725956	15.50650845	0.015143075	0.121145
16	256	4	1024	5.691359	21.04991128	0.020556554	0.082226
16	1024	1	1024	7.280379	16.45554469	0.016069868	0.01607
64	512	8	4096	2.016318	59.4165216	0.014505987	0.116048
64	1024	4	4096	1.430817	83.73020589	0.020441945	0.081768
64	4096	1	4096	1.875909	63.86375992	0.015591738	0.015592

Total Threads	*1 Thread/Rank*	*4 Thread/Rank*	*8 Thread/Rank*
64	117.8925	95.78434	119.8026
256	28.39189	22.74454	23.02291
1024	7.280379	5.691359	7.725956
4096	1.875909	1.430817	2.016318



NOTE: MPI Rank Counts as 1 Thread