1. Tell what machine you ran this on

   Zephyrus 14

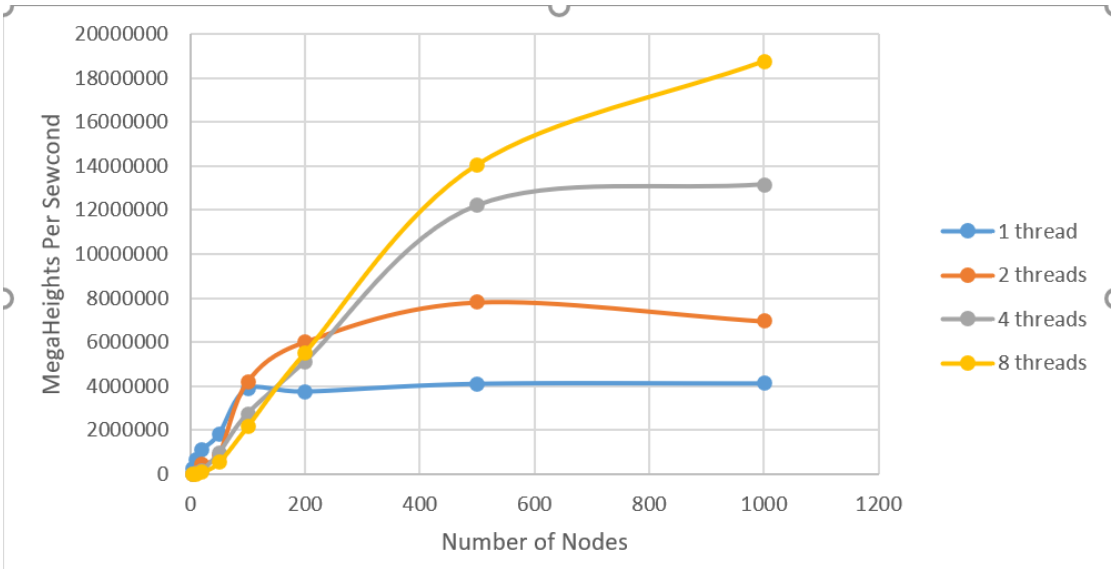
2. What do you think the actual volume is?

   1, I guess.

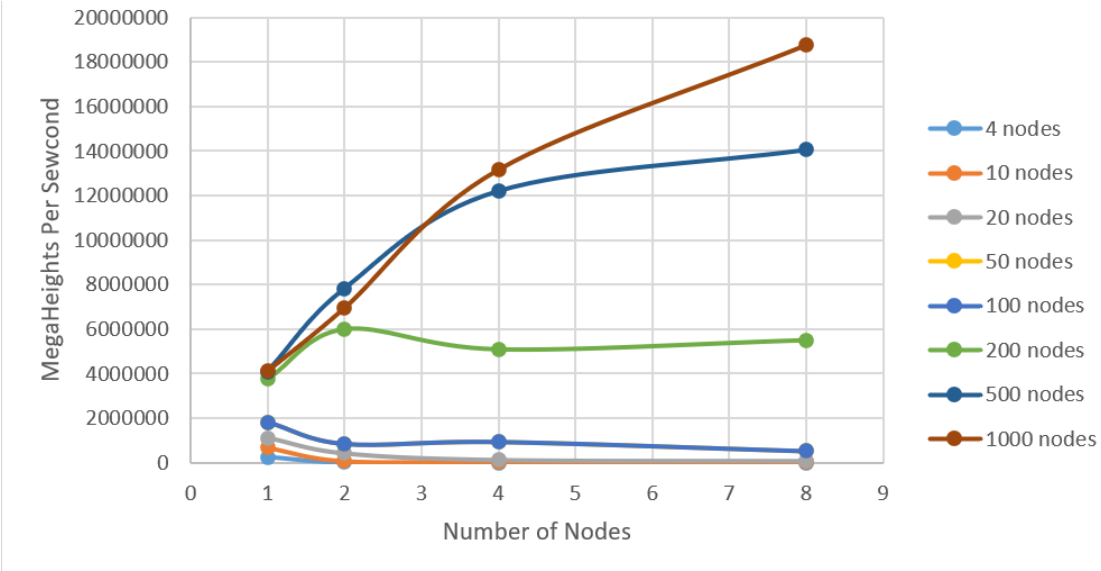
heights persecond								
NUMNODES / NUMT	4	10	20	50	100	200	500	1000
1	253969.14	668002.26	1121705.24	1826284.1	3891353.4	3754740.33	4101157.5	4119995.7
2	25604.1	76115.09	436205.02	856164.42	4192872.12	6008712.48	7819488.63	6955123.45
4	6723.25	57790.11	142282.92	940698.38	2735903.25	5103407.83	12202681.73	13154952.18
8	4130.84	14771.48	96103.02	533321.97	2157823.18	5514123.09	14053628.69	18747410.52
Volome								
1	0.002016	0.112569	0.139471	0.149245	0.151089	0.151663	0.15186	0.151868
2	0.002016	0.112569	0.139471	0.14405	0.149867	0.145377	0.139147	0.15046
4	0.002016	0.112569	0.139435	0.146692	0.145628	0.143036	0.149707	0.149736
8	0.002016	0.112569	0.139471	0.149101	0.142546	0.145774	0.144344	0.144022
Time	4	10	20	50	100	200	500	1000
1	0.00006	0.00015	0.00036	0.00137	0.00257	0.01065	0.06096	0.24272
2	0.00062	0.00131	0.00092	0.00292	0.00238	0.00666	0.03197	0.14378
4	0.00238	0.00173	0.00281	0.00266	0.00377	0.00784	0.02049	0.07602
8	0.00387	0.00677	0.00416	0.00469	0.00463	0.00725	0.01779	0.05334

3.

   Performance as a function of NUMNODES with colored lines showing different NUMT values



Performance as a function of NUMT with colored lines showing different NUMNODES values



4. What patterns are you seeing in the speeds?

    1) With the threads increase, the speed increase， except for the low nodes area;

    2) With the increasing of the number of nodes we use, the speed increase.

5. Why do you think it is behaving this way?

    1) For low threads part, maybe the costing time of separating jobs cause this;

    2) Is due to each area of point (iu and iv consist of) is smaller along with the number of nodes increase.

6. What is the Parallel Fraction for this application, using the Inverse Amdahl equation?

Time		4	10	20	50	100	200	500	1000
	1	0.00006	0.00015	0.00036	0.00137	0.00257	0.01065	0.06096	0.24272
	2	0.00062	0.00131	0.00092	0.00292	0.00238	0.00666	0.03197	0.14378
	4	0.00238	0.00173	0.00281	0.00266	0.00377	0.00784	0.02049	0.07602
	8	0.00387	0.00677	0.00416	0.00469	0.00463	0.00725	0.01779	0.05334
Speedup									
	1	1	1	1	1	1	1	1	1
	2	10.33333333	8.733333333	2.555555556	2.131386861	0.926070039	0.625352113	0.524442257	0.592369809
	4	39.66666667	11.53333333	7.805555556	1.941605839	1.46692607	0.736150235	0.336122047	0.52872444
	8	64.5	45.13333333	11.55555556	3.423357664	1.80155642	0.680751174	0.291830709	0.701657459
Parallel Fraction									
	1								
	2	1.806451613	1.770992366	1.217391304	1.061643836	-0.159663866	-1.198198198	-1.81357523	-1.3762693
	4	1.299719888	1.217726397	1.162514828	0.646616541	0.424403183	-0.477891156	-2.63347975	-1.18845918
	8	1.125138427	1.117535345	1.043956044	0.809016144	0.508485035	-0.535960591	-2.77330764	-0.48593926
AVERAGE		0.107035283							

Averagely, it’ s 10.7%.

7. Given that Parallel Fraction, what is the maximum speed-up you could *ever* get?

Max Speedup = 1 / (1-F_p) =1.12.