

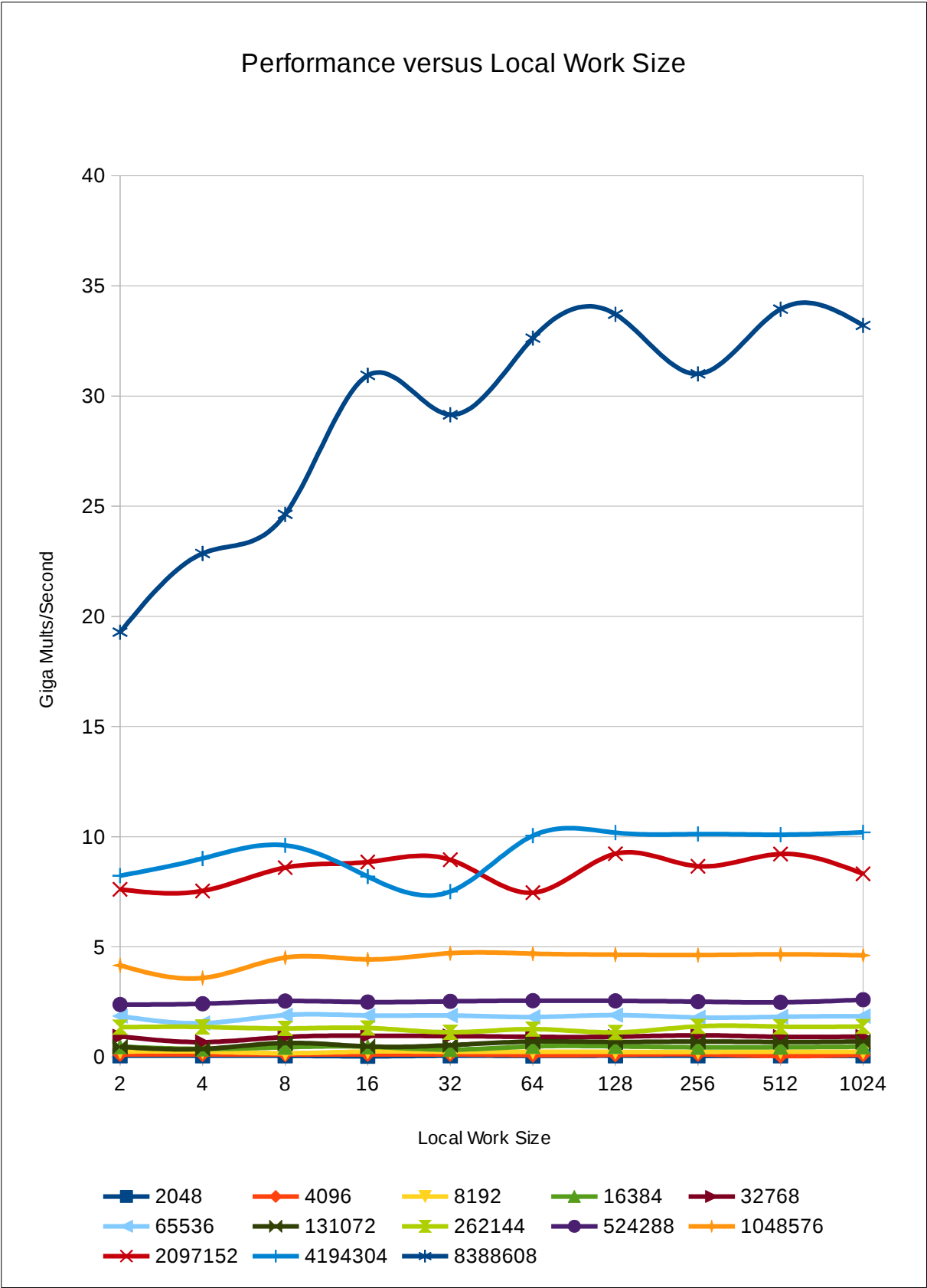
**Platform:**

I ran this on my laptop. It is running Ubuntu 14.04. It has an Nvidia GT 550m gpu.

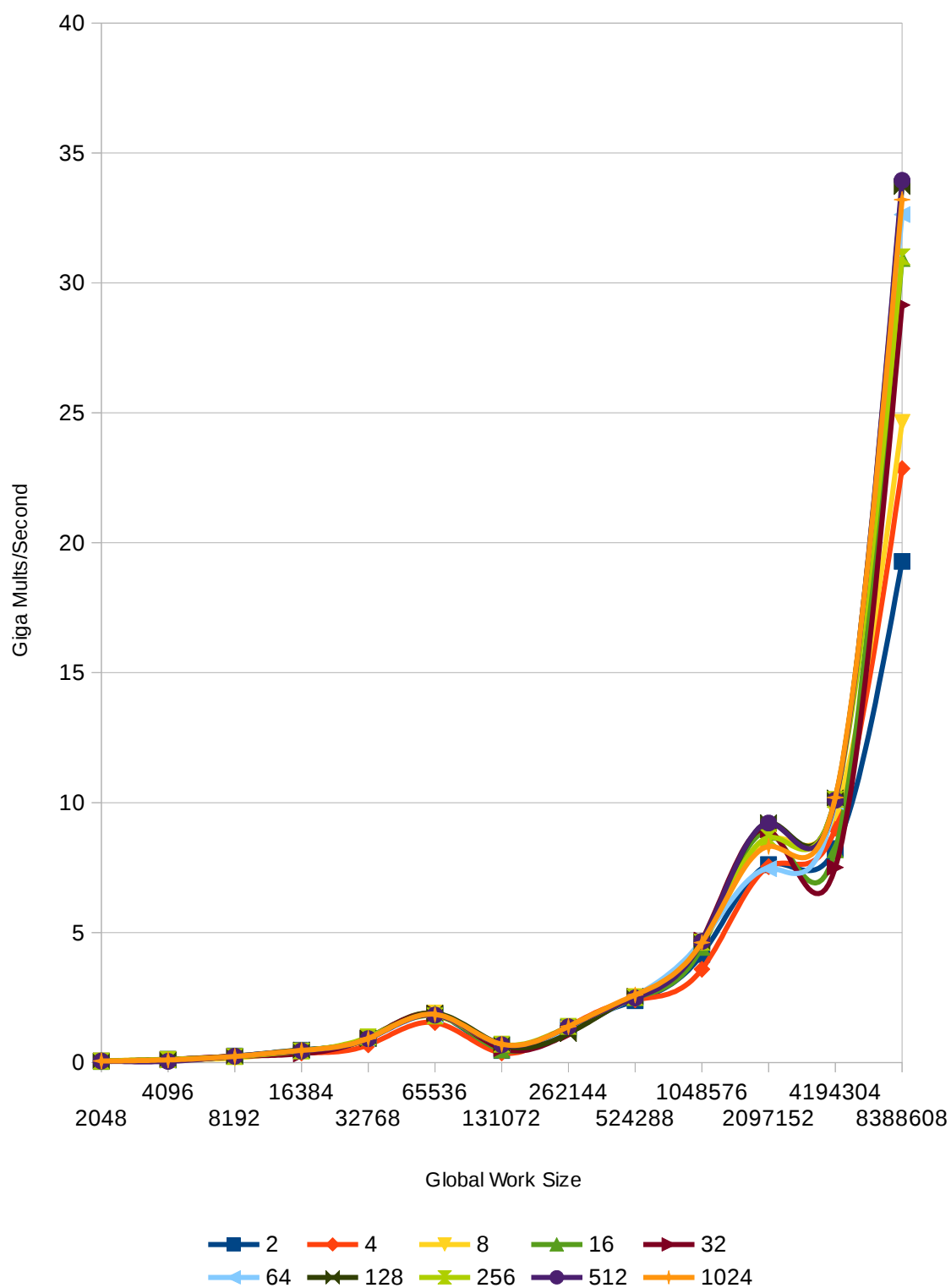
**Data:**

LOCAL_SIZE	NUM_ELEMENTS												
	2048	4096	8192	16384	32768	65536	131072	262144	524288	1048576	2097152	4194304	8388608
2	0.061	0.123	0.247	0.473	0.941	1.86	0.464	1.355	2.384	4.161	7.612	8.23	19.281
4	0.06	0.117	0.246	0.369	0.678	1.538	0.368	1.366	2.418	3.589	7.54	9.012	22.854
8	0.059	0.118	0.175	0.446	0.908	1.903	0.637	1.296	2.541	4.511	8.598	9.609	24.63
16	0.035	0.12	0.249	0.469	0.965	1.886	0.482	1.32	2.496	4.431	8.851	8.191	30.938
32	0.061	0.119	0.239	0.339	0.95	1.885	0.539	1.124	2.528	4.714	8.955	7.51	29.149
64	0.051	0.086	0.238	0.482	0.918	1.818	0.702	1.266	2.558	4.691	7.461	10.047	32.629
128	0.06	0.1	0.234	0.486	0.923	1.902	0.685	1.118	2.549	4.646	9.227	10.184	33.711
256	0.058	0.121	0.231	0.444	0.983	1.797	0.706	1.393	2.515	4.629	8.659	10.12	31.006
512	0.058	0.046	0.243	0.449	0.919	1.827	0.684	1.378	2.485	4.661	9.216	10.094	33.943
1024	0.057	0.102	0.237	0.468	0.929	1.855	0.707	1.387	2.602	4.617	8.316	10.196	33.205

Graphs:



Performance versus Global Work Size



### **Patterns:**

#### Global Work Size:

As the global work size increased, the GigMults/Second most increased but not at very large rate. It wasn't until the array size was 4M that any large amount of performance increase was noticed. There was a small uptick around 2M though.

#### Local Work Size:

The GigaMults/Second for this graph seemed relatively stable. The one outlier is when the array size was 8M. This had a much larger performance for all the tested Local Work Sizes, and had an overall increase in performance as the Local Work Size increased.

### **Explanation:**

#### Global Work Size:

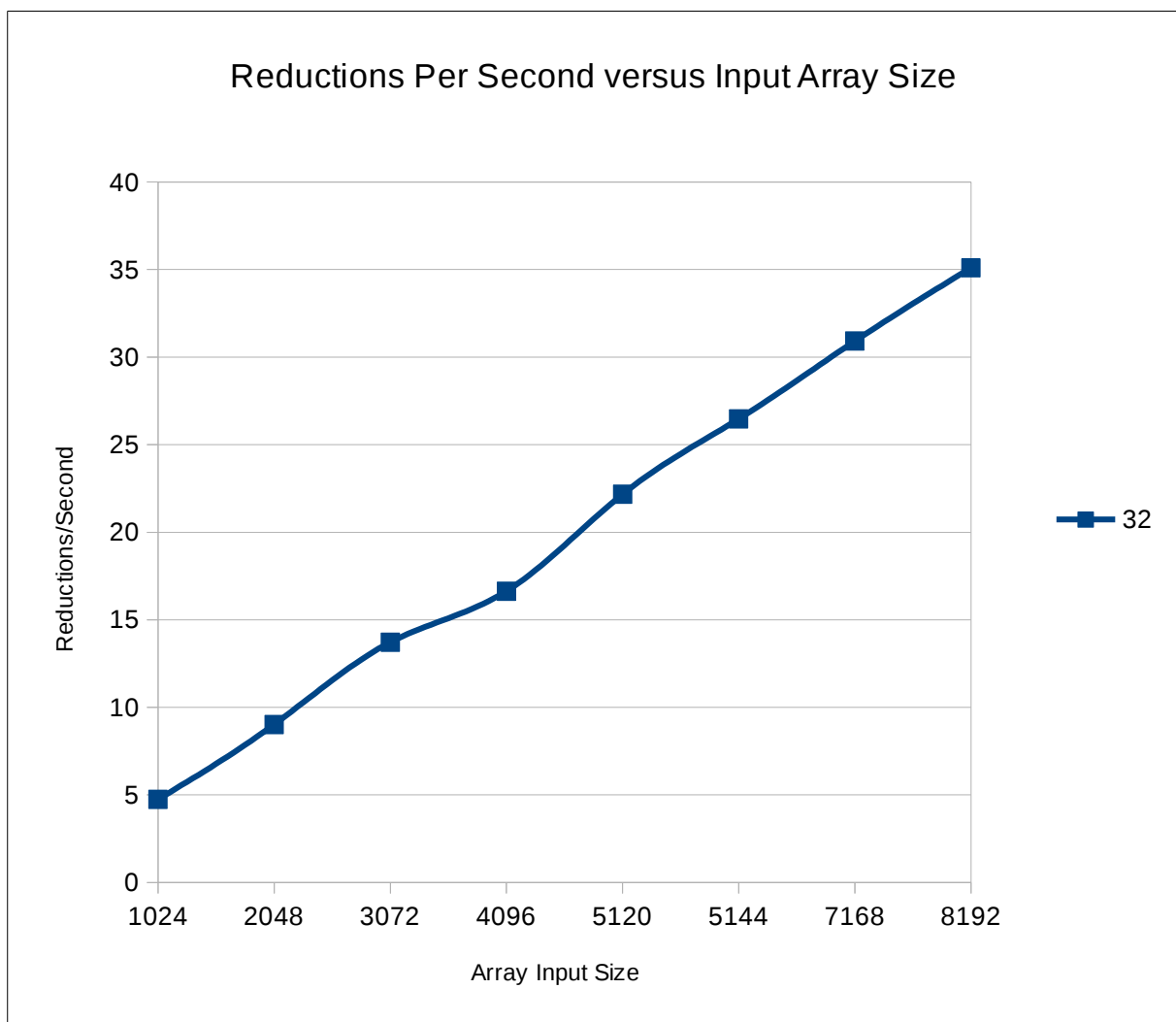
The most probably reason for this is that the GPU compute operations for these sizes were not using the GPU's resources optimally. And it wasn't until the number of array elements approached 1 million that any appreciable performance was gained. This pattern stayed constant across all of the tested Local Work sizes per number of array elements tested.

#### Local Work Size:

The performance related to the Local Work Size did not seem to have an appreciable difference on the performance. The most probable reason is that the Local Work Size never went over the max Local Work Size the GPU could handle. Once thing to note is that most odd numbered Local Work Sizes and some even numbered Local Work Sizes cause the OpenCL to error out. To remedy this, I used Local Work Sizes in powers of 2 until I reached 1024.

### **Reductions:**

	NUM_ELEMENTS							
LOCAL_SIZE	1024	2048	3072	4096	5120	5144	7168	8192
32	4.748	9.023	13.719	16.635	22.173	26.474	30.917	35.098



**Pattern:**

The scaling is linear as the array input size increases.

**Explanation:**