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CS 575

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1. What machine you ran this on

I have selected Platform #0, Device #0: Vendor = NVIDIA, Type = CL\_DEVICE\_TYPE\_GPU

1. Show the table and graphs

\*\* m 21.07 b 1.61 \*\* 4096 8 65.12

\*\* m 21.07 b 1.61 \*\* 4096 32 41.62

\*\* m 21.07 b 1.61 \*\* 4096 64 41.86

\*\* m 21.07 b 1.61 \*\* 4096 128 32.68

\*\* m 21.07 b 1.61 \*\* 4096 256 36.44

\*\* m 20.89 b 1.76 \*\* 16384 8 154.79

\*\* m 20.89 b 1.76 \*\* 16384 32 220.31

\*\* m 20.89 b 1.76 \*\* 16384 64 194.34

\*\* m 20.89 b 1.76 \*\* 16384 128 228.42

\*\* m 20.89 b 1.76 \*\* 16384 256 226.59

\*\* m 20.96 b 1.66 \*\* 65536 8 154.05

\*\* m 20.96 b 1.66 \*\* 65536 32 269.06

\*\* m 20.96 b 1.66 \*\* 65536 64 219.02

\*\* m 20.96 b 1.66 \*\* 65536 128 234.29

\*\* m 20.96 b 1.66 \*\* 65536 256 201.4

\*\* m 21.04 b 1.67 \*\* 262144 8 295.64

\*\* m 21.04 b 1.67 \*\* 262144 32 339.67

\*\* m 21.04 b 1.67 \*\* 262144 64 349.74

\*\* m 21.04 b 1.67 \*\* 262144 128 361.82

\*\* m 21.04 b 1.67 \*\* 262144 256 533.81

\*\* m 21.04 b 1.66 \*\* 1048576 8 1183.29

\*\* m 21.04 b 1.66 \*\* 1048576 32 1751.23

\*\* m 21.04 b 1.66 \*\* 1048576 64 1717.22

\*\* m 21.04 b 1.66 \*\* 1048576 128 1698.56

\*\* m 21.04 b 1.66 \*\* 1048576 256 1304.86

\*\* m 21.07 b 1.66 \*\* 4194304 8 1773.09

\*\* m 21.07 b 1.66 \*\* 4194304 32 3127.54

\*\* m 21.07 b 1.66 \*\* 4194304 64 4096.62

\*\* m 21.07 b 1.66 \*\* 4194304 128 3336.47

\*\* m 21.07 b 1.66 \*\* 4194304 256 3665.46

1. What patterns are you seeing in the performance curves? What difference does the size of data make? What difference does the size of each work-group make?

The patterns observed are that as the data size increases the performance also increases. For larger local size, the larger data size benefits best and the same is true for vice versa. When the local size is too large for the data size, the overhead becomes significant and the performance dips.

1. Why do you think the patterns look this way?

The patterns observed are primarily due to memory and computation trade-offs, parallelism, and hardware utilization. Smaller local size has smaller overhead and the same is true for the opposite.