Analysis Report

fix_errors1(char*, Param*)

Duration	8.157 s (8,156,579,635 ns)
Grid Size	[256,1,1]
Block Size	[256,1,1]
Registers/Thread	97
Shared Memory/Block	0 B
Shared Memory Requested	48 KiB
Shared Memory Executed	48 KiB
Shared Memory Bank Size	4 B

[0] Tesla K20m

Compute Capability	3.5
Max. Threads per Block	1024
Max. Shared Memory per Block	48 KiB
Max. Registers per Block	65536
Max. Grid Dimensions	[2147483647, 65535, 65535]
Max. Block Dimensions	[1024, 1024, 64]
Max. Warps per Multiprocessor	64
Max. Blocks per Multiprocessor	16
Number of Multiprocessors	13
Multiprocessor Clock Rate	705.5 MHz
Concurrent Kernel	true
Max IPC	7
Threads per Warp	32
Global Memory Bandwidth	208 GB/s
Global Memory Size	4.687 GiB
Constant Memory Size	64 KiB
L2 Cache Size	1.25 MiB
Memcpy Engines	2
PCIe Generation	2
PCIe Link Rate	5 Gbit/s
PCIe Link Width	16

1. Compute, Bandwidth, or Latency Bound

The first step in analyzing an individual kernel is to determine if the performance of the kernel is bounded by computation, memory bandwidth, or instruction/memory latency. Unfortunately, the device executing this kernel can not provide the profile data needed for this analysis.

2. Instruction and Memory Latency

Instruction and memory latency limit the performance of a kernel when the GPU does not have enough work to keep busy.
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3. Compute Resources

GPU compute resources limit the performance of a kernel when those resources are insufficient or poorly utilized. Compute resources are used most efficiently when all threads in a warp have the same branching and predication behavior. The results below indicate that a significant fraction of the available compute performance is being wasted because branch and predication behavior is differing for threads within a warp.

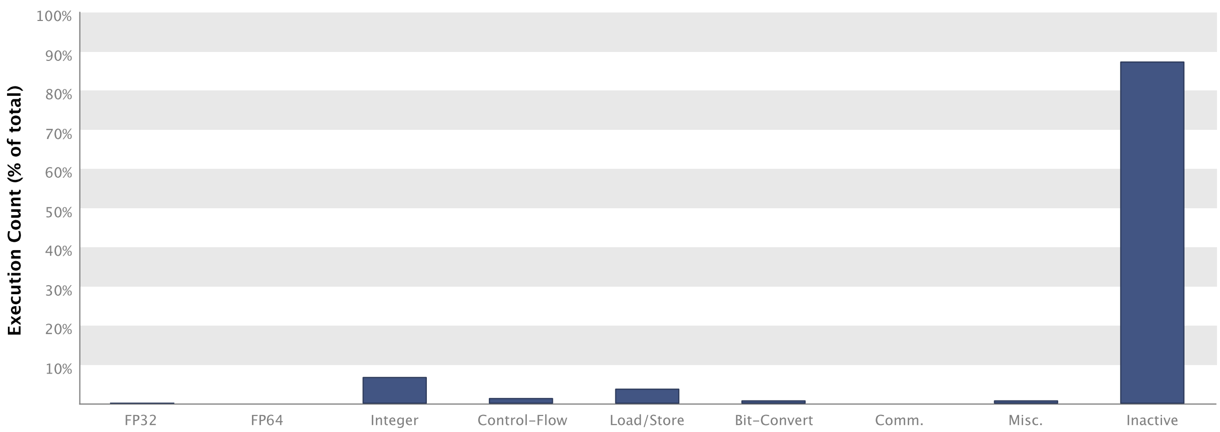
3.1. Low Warp Execution Efficiency

Warp execution efficiency is the average percentage of active threads in each executed warp. Increasing warp execution efficiency will increase utilization of the GPU's compute resources. The kernel's warp execution efficiency of 13.2% is less than 100% due to divergent branches and predicated instructions. If predicated instructions are not taken into account the warp execution efficiency for these kernels is 13.8%.

Optimization: Reduce the amount of intra-warp divergence and predication in the kernel.

3.2. Instruction Execution Counts

The following chart shows the mix of instructions executed by the kernel. The instructions are grouped into classes and for each class the chart shows the percentage of thread execution cycles that were devoted to executing instructions in that class. The "Inactive" result shows the thread executions that did not execute any instruction because the thread was predicated or inactive due to divergence.



3.3. Floating-Point Operation Counts

The following chart shows the mix of floating-point operations executed by the kernel. The operations are grouped into classes and for each class the chart shows the percentage of thread execution cycles that were devoted to executing operations in that class. The results do not sum to 100% because non-floating-point operations executed by the kernel are not shown in this chart.


100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
Execution Count (% of total)
FP32 Add
FP32 Mul
FP32 Mul-Add
FP Special
FP64 Add
FP64 Mul
FP64 Mul-Add

4. Memory Bandwidth

Memory bandwidth limits the performance of a kernel when one or more memories in the GPU cannot provide data at the rate requested by the kernel. Unfortunately, the device executing this kernel can not provide the profile data needed for this analysis.