AMD **Accelerated** Parallel Processing TECHNOLOGY

SAMPLE

256-Bin Histogram

1 Overview

1.1 Location

`$<APPSDKSamplesInstallPath>\samples\opencl\cl\`

1.2 How to Run

See the *Getting Started* guide for how to build samples. You first must compile the sample.

Use the command line to change to the directory where the executable is located. The pre-compiled sample executable is at `$<APPSDKSamplesInstallPath>\samples\opencl\bin\x86\` for 32-bit builds, and `$<APPSDKSamplesInstallPath>\samples\opencl\bin\x86_64\` for 64-bit builds.

Type the following command(s).

1. `Histogram`
   Runs with default options; x = 1024, y = 1024.
2. `Histogram -h`
   This prints the help file.

1.3 Command Line Options

Table 1 lists, and briefly describes, the command line options.

Table 1 Command Line Options

Short Form	Long Form	Description
`-h`	`--help`	Shows all command options and their respective meaning.
	`--device`	Devices on which the program is to be run. Acceptable values are `cpu` or `gpu`.
`-q`	`--quiet`	Quiet mode. Suppresses all text output.
`-e`	`--verify`	Verify results against reference implementation.
`-t`	`--timing`	Print timing.
	`--dump`	Dump binary image for all devices.
	`--load`	Load binary image and execute on device.
	`--flags`	Specify compiler flags to build the kernel.
`-p`	`--platformId`	Select platformId to be used (0 to N-1, where N is the number of available platforms).
`-d`	`--deviceId`	Select deviceId to be used (0 to N-1, where N is the number of available devices).
`-v`	`--version`	AMD APP SDK version string.
`-x`	`--width`	Width of the input array.
`-y`	`--height`	Height of the input array.

Short Form	Long Form	Description
-i	--iterations	Number of iterations for kernel execution.
	--scalar	Run the scalar version of the kernel (Note that the --scalar and --vector options are mutually exclusive.)
	--vector	Run the vector version of the kernel (Note that the --scalar and --vector options are mutually exclusive.)

2 Implementation Details

Each work-item calculates the histogram bin from BIN_SIZE elements. The block histogram bin are calculated from the histogram bins of the work-items of each block. The final histogram bin is calculated from the block histogram bins on the host (CPU) side.

The implementation contains two kernels: a scalar kernel and a vector kernel. The scalar kernel works better on current generation GCN cards. The vector kernel kernel works better on VLIW and previous generation cards. The user can select the kernel using the --scalar or --vector options; otherwise, preferred vector-width for the device is queried and used. If both --scalar and --vector are specified, both the options are ignored and the default vector-width will be used.

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