

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. `Reduction`
Runs with default option `x = 8192`.
2. `Reduction -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 <code>cpu</code> or <code>gpu</code> .
-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	--length	Length of the input array.
-i	--iterations	Number of iterations for kernel execution.

2 Implementation Details

Reduction consists of:

1. Dividing the input array into blocks.
2. Calculating the sum of blocks.
3. Calculating the sum of block sums.

Each block invocation of the kernel reduces the input array block to a single value; it then writes this value to output and reduces the block sums to a final result, which is sent to the host.

Each work-item loads its data from an input array to a shared memory of block. The reduction of each block is done in multiple passes. In first pass, half work-items are active, and they update their values in shared memory by adding other half values in shared memory. In subsequent passes, the number of active threads are reduced to half, and they keep updating their value with other half values of shared memory.

3 Recommended Input Option Settings

For best performance, enter the following on the command line: `-x 33554432 -i 5 -q -t`

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