

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. `AtomicCounter`
This runs the program with the default option `-x = 1024`.
2. `AtomicCounter -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. |
| -i | --iterations | Number of iterations for kernel execution. |
| -x | --length | Length of the input array. |

2 Implementation

This algorithm finds the occurrences of a given value in an unsorted input array. The algorithm is implemented in two ways:

- Global atomics (`cl_khr_global_int32_base_atomics`).
- Atomic counters (`cl_ext_atomic_counters_32`).

IT then compares the performances between these two implementations.

3 Results

Here are the results for a system with a Cypress GPU, running under 64-bit Win7.

```
AtomicCounters.exe -e -q -t -x 16777216 -i 100
```

| Elements | Occurrences | AtomicsCounter (sec) | GlobalAtomics (sec) |
|----------|-------------|----------------------|---------------------|
| 16777216 | 3359805 | 0.00144894 | 0.0732824 |

```
AtomicCounters.exe -e -q -t -x 16777216 -i 100 (here input array filled with same value)
```

| Elements | Occurrences | AtomicsCounter (sec) | GlobalAtomics (sec) |
|----------|-------------|----------------------|---------------------|
| 16777216 | 16777216 | 0.0014425 | 0.357597 |

Using the Atomic Counters clearly shows the performance level that can be achieved using AMD GPUs.

Contact

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