

Global Memory Bandwidth

1 Overview

1.1 Location `$<AMDAPPSDKSamplesInstallPath>\samples\opencl\benchmark\`

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 default executables are placed in `$<AMDAPPSDKSamplesInstallPath>\samples\opencl\bin\x86` for 32-bit builds and `$<AMDAPPSDKSamplesInstallPath>\samples\opencl\bin\x86_64` for 64-bit builds.

Type the following command(s).

1. `GlobalMemoryBandwidth`
Measures the peak bandwidth from a hardware-constant buffer using various access patterns.
2. `GlobalMemoryBandwidth -h`
This prints the help message.

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).

Short Form	Long Form	Description
-v	--version	AMD APP SDK version string.
-i	--iterations	Number of iterations for kernel execution.
-c	--components	Number of vector components (vector-width to be used in the kernel).

2 Implementation Details

The sample measures the peak-bandwidth of the global buffer using the following sub-tests. It shows peak bandwidth for the device buffer. For devices on OpenCL version 2.0 and higher, it additionally shows peak bandwidth for the Shared Virtual Memory (SVM) buffer.

1. Read Bandwidth (single access) — All threads are read from a single memory location.
2. Read Bandwidth (linear access) — Threads read from global memory in a sequential access pattern.
3. Write Bandwidth (linear access) — Threads write to global memory in a sequential access pattern.
4. Read bandwidth (linear access and uncached) — Threads read from global memory in a sequential access pattern and ensure that the cache is not used.

If vector-width is not specified at command-line using the "-c" option, the preferred vector-width for the device will be queried and used. The "--dump" and "--load" options will always dump and load kernel binaries for vector-width 1 irrespective of the vector-width that was passed using the command-line.

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