AMD **Accelerated**
Parallel Processing
TECHNOLOGY

1 Overview

1.1 Location

`$(AMDAPPSDKSAMPLESROOT)\samples\opencl\cl\app`

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 `$(AMDAPPSDKSAMPLESROOT)\samples\opencl\bin\x86` for 32-bit builds and `$(AMDAPPSDKSAMPLESROOT)\samples\opencl\bin\x86_64\` for 64-bit builds.

Type the following command(s).

1. `ConstantBandwidth`
   Measures the peak bandwidth from a hardware-constant buffer using various access patterns.

2. `ConstantBandwidth -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 `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.
-i	--iterations	Number of iterations for kernel execution.
-c	--components	Number of vector components.

2 Implementation Details

This sample measures the peak bandwidth from a constant buffer using the following access patterns.

1. Single access (static index) — All threads access a single memory location from the constant buffer multiple times using an index known at compile time.

   Measured bandwidth on the ATI Radeon™ HD 5870 GPU: ~ 4200 GB/s

2. Single access (dynamic index) — The index is passed through the host, and threads do multiple reads in the constant buffer using this index and a static offset.

   Measured bandwidth on ATI Radeon™ HD 5870 GPU: ~ 1078.97 GB/s

3. Linear access — Threads access the constant buffer in a sequential memory access pattern.

   Measured bandwidth on ATI Radeon™ HD 5870 GPU ~ 620.306 GB/s

4. Random access — Threads randomly access the constant buffer through indices passed through a separate constant buffer.

   Measured bandwidth on ATI Radeon™ HD 5870 GPU ~ 352.113 GB/s