ROCm Bandwith Test

The benchmark application rocm_bandwidth_test was developed to allow users discover the performance characteristics of Host-To-Device, Device-To-Host and Device-To-Device copy operations on a Rocm platform. The application can be run on any compliant Rocm platform. The application provides various options for users to experiment the cost of various copy operations in both unidirectional and bidirectional modes. Users can query the various options that are supported by giving the "**-h**" option.

The following sections show how users can use the benchmark to get performance data for various scenarios:

@note: The test will filter out certain operations that are either considered not supported or don't make sense. These include the following:

- No copy requests when both Src and Dst devices are Cpu.
- No copy requests when both Src and Dst devices are Same Gpu device and the request is either a partial or a full bidirectional copy operation

Help Screen: Run the benchmark to print the help screen

```
<shell_prompt> ./rocm_bandwidth_test  -h
```

Print Version of RocmBandwidthTest: Run the benchmark to print version of the test

```
<shell_prompt> ./rocm_bandwidth_test  -q
```

Print Rocm Topolgoy: Run the benchmark to print topology of the various devices, their allocatable memory and access paths

```
<shell_prompt> ./rocm_bandwidth_test  -t
```

The above command will print three things: List of devices and their allocatable memory, Access matrix and Numa Distance among the various devices.

Default Unidirectional & Bidirectional All Devices Bandwidth: Run the benchmark to collect performance characteristics of **unidirectional** an d **bidirectional** copy operations involving **ALL** devices of a given Rocm platform.

```
<shell_prompt> ./rocm_bandwidth_test
```

The above command will issue unidirectional and **bidirectional** copy operations among all the devices of the platform.

Host-To-Device (H2D) Bandwidth: Run the benchmark to collect performance characteristics of H2D copy operations of a given Rocm platform

```
<shell_prompt> ./rocm_bandwidth_test  -s  <cpu_dev_IdX>,<cpu_dev_IdY>,- - -    -d
<gpu_dev_IdM>,<gpu_dev_IdN>, - - -
```

The above command will issue unidirectional copy operations between Src and Dst devices. Specifically it will pair each device of Src List it with each device of Dst List i.e. it will launch sizeof(SrcList) x sizeof(DstList) number of copy operations. It is assumed that user has determined access from Src device to Dst device exists by consulting device access matrix.

Device-To-Host (D2H) Bandwidth: Run the benchmark to collect performance characteristics of D2H copy operations of a given Rocm platform

```
<shell_prompt> ./rocm_bandwidth_test  -s  <gpu_dev_IdX>,<gpu_dev_IdY>,- - -    -d
<cpu_dev_IdM>,<cpu_dev_IdN>, - - -
```

The above command will issue unidirectional copy operations between Src and Dst devices. Specifically it will pair each device of Src List it with each device of Dst List i.e. it will launch sizeof(SrcList) x sizeof(DstList) number of copy operations. It is assumed that user has determined access from Src device to Dst device exists by consulting device access matrix.

Device-To-Device (D2D) Bandwidth: Run the benchmark to collect performance characteristics of D2D copy operations of a given Rocm platform

```
<shell_prompt> ./rocm_bandwidth_test  -s  <gpu_dev_IdX>,<gpu_dev_IdY>,- - -    -d  <gpu_dev_IdM>,<gpu_
dev_IdN>, - - -
```

The above command will issue copy unidirectional operations between Src and Dst devices. Specifically it will pair each device of Src List it

with each device of Dst List i.e. it will launch sizeof(SrcList) x sizeof(DstList) number of copy operations. It is assumed that user has determined access from Src device to Dst device exists by consulting device access matrix.

Bidirectional Bandwidth: Run the benchmark to collect performance characteristics of bidirectional copy operations of a given Rocm platform

```
<shell_prompt> ./rocm_bandwidth_test  -b  <device_IdX>,<device_IdY>,<device_IdZ>,- - -
```

The above command will issue bidirectional copy operations among all the devices of the list. In the example given it will issue copy(x,x), copy(x,y), copy(x,z), copy(y,x), copy(y,y), copy(y,z), copy(z,x), copy(z,y) and copy(z,z) operations. The devices can be either be all Gpu's or Gpu/Cpu combination.

Unidirectional All Devices Bandwidth: Run the benchmark to collect performance characteristics of **unidirectional** copy operations involving **ALL** devices of a given Rocm platform.

```
<shell_prompt> ./rocm_bandwidth_test  -a
```

The above command will issue unidirectional copy operations among all the devices of the platform.

Bidirectional All Devices Bandwidth: Run the benchmark to collect performance characteristics of **bidirectional** copy operations involving **ALL** devices of a given Rocm platform.

```
<shell_prompt> ./rocm_bandwidth_test  -A
```

The above command will issue bidirectional copy operations among all the devices of the platform.