SPEC ACCEL™ OCL Result

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Cray
(Test Sponsor: Indiana University)

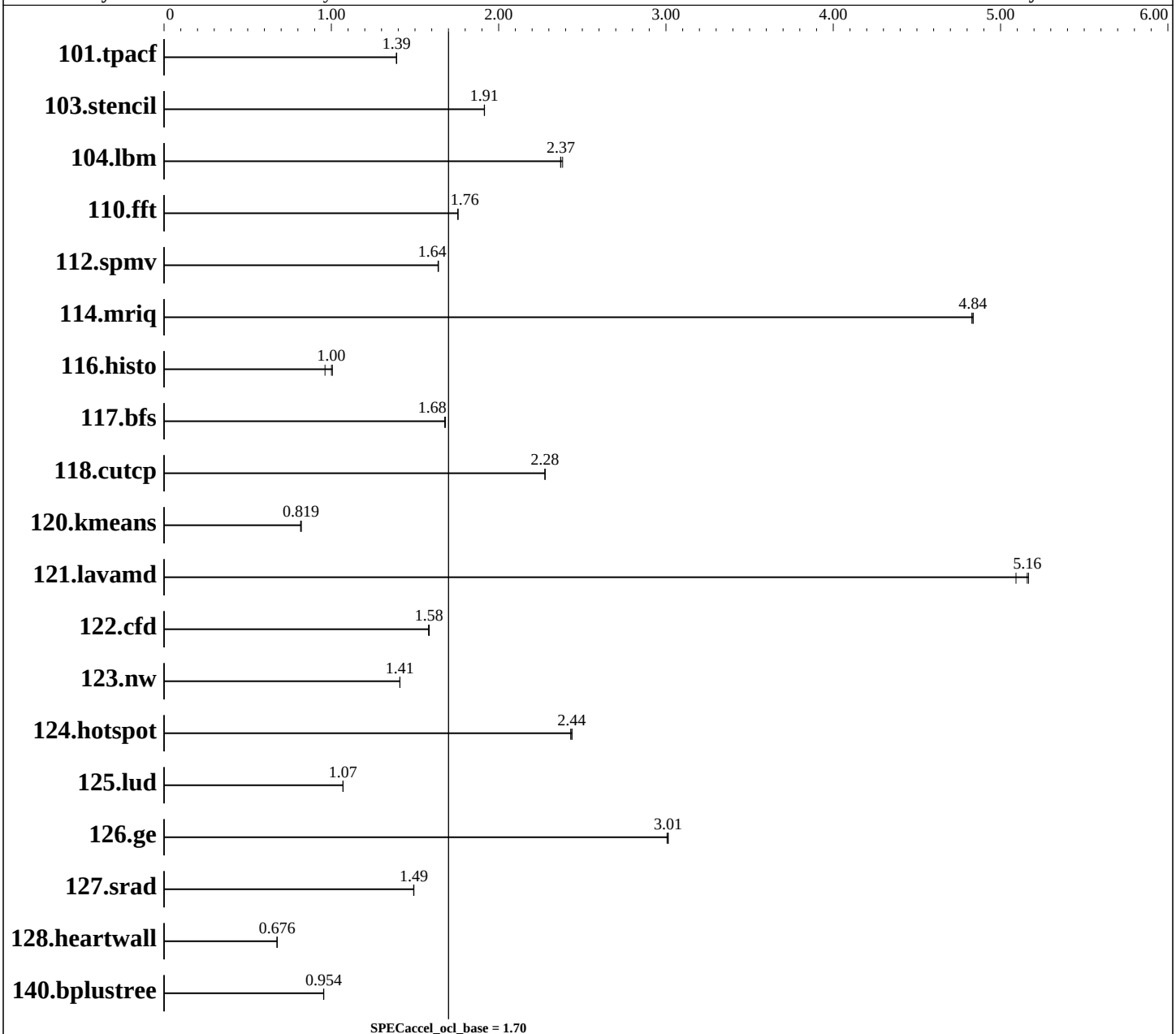
NVIDIA Tesla K20
Cray XK7

SPECaccel_ocl_peak = Not Run

SPECaccel_ocl_base = 1.70

ACCEL license: 3440A
Test sponsor: Indiana University
Tested by: Indiana University

Test date: Mar-2017
Hardware Availability: Apr-2013
Software Availability: Jan-2017



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Hardware

CPU Name:	AMD Opteron 6276
CPU Characteristics:	AMD Turbo CORE Technology up to 3.2GHz, Turbo CORE off
CPU MHz:	2300
CPU MHz Maximum:	3200
FPU:	Integrated
CPU(s) enabled:	16 cores, 1 chip, 16 cores/chip
CPU(s) orderable:	1 chip
Primary Cache:	32 KB I + 16 KB D on chip per core
Secondary Cache:	16 MB I+D on chip per chip, 2 MB shared / 2 cores
L3 Cache:	16 MB I+D on chip per chip, 8 MB shared / 8 cores
Other Cache:	None
Memory:	32 GB (4 x 8 GB 2Rx4 PC3L-12800R-11, ECC)
Disk Subsystem:	None
Other Hardware:	None

Accelerator

Accel Model Name:	Tesla K20
Accel Vendor:	NVIDIA
Accel Name:	NVIDIA Tesla K20
Type of Accel:	GPU
Accel Connection:	PCIe 2.0 16x
Does Accel Use ECC:	yes
Accel Description:	NVIDIA Tesla K20m GPU, 2496 CUDA cores, 706MHz, 5 GB GDDR5 RAM
Accel Driver:	NVIDIA UNIX x86_64 Kernel Module 352.68

Software

Operating System:	SUSE Linux Enterprise Server 11 (x86_64), Cray Linux Environment 5.2 3.0.101-0.46.1_1.0502.8871-cray_gem_c
Compiler:	GNU Fortran (GCC) 5.3.0
File System:	NFSv3 (DDN SFA12KE) over 10GB Ethernet
System State:	Run level 3 (Multi-user)
Other Software:	NVIDIA CUDA 7.5.18

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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
101.tpacf	77.0	1.39	**77.0**	**1.39**	77.0	1.39						
103.stencil	65.3	1.92	65.3	1.91	**65.3**	**1.91**						
104.lbm	47.0	2.38	**47.2**	**2.37**	47.3	2.37						
110.fft	63.2	1.76	**63.2**	**1.76**	63.2	1.76						
112.spmv	89.8	1.64	89.6	1.64	**89.7**	**1.64**						
114.mriq	22.6	4.83	**22.5**	**4.84**	22.5	4.84						
116.histo	**114**	**1.00**	118	0.962	113	1.01						
117.bfs	69.7	1.68	69.6	1.68	**69.7**	**1.68**						
118.cutcp	43.5	2.28	43.5	2.28	**43.5**	**2.28**						
120.kmeans	**122**	**0.819**	122	0.820	123	0.816						
121.lavamd	21.1	5.17	**21.1**	**5.16**	21.4	5.09						
122.cfd	79.5	1.59	79.7	1.58	**79.5**	**1.58**						
123.nw	**81.6**	**1.41**	81.5	1.41	81.6	1.41						
124.hotspot	46.7	2.44	**46.8**	**2.44**	46.9	2.43						
125.lud	**111**	**1.07**	111	1.07	111	1.07						
126.ge	51.4	3.01	**51.4**	**3.01**	51.6	3.01						
127.srad	76.3	1.49	**76.3**	**1.49**	76.4	1.49						
128.heartwall	**157**	**0.676**	157	0.676	157	0.675						
140.bplustree	113	0.955	**113**	**0.954**	113	0.953						

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Platform Notes

```
Sysinfo program
/N/dc2/projects/hpc/lijunj/SPEC/accel-1.1-run/bigred2/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #$ c05a7f14b1b1765e3fe1df68447e8a35
running on nid00221 Fri Mar 10 13:54:43 2017

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
  http://www.spec.org/accel/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : AMD Opteron(TM) Processor 6276
      1 "physical id"s (chips)
      16 "processors"
   cores, siblings (Caution: counting these is hw and system dependent.  The
   following excerpts from /proc/cpuinfo might not be reliable.  Use with
```

Continued on next page

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Platform Notes (Continued)

```
      caution.)
         cpu cores : 8
         siblings  : 16
         physical 0: cores 0 1 2 3 4 5 6 7
      cache size : 2048 KB

   From /proc/meminfo
      MemTotal:       33083764 kB
      HugePages_Total:       0
      Hugepagesize:       2048 kB

   /usr/bin/lsb_release -d
      SUSE Linux Enterprise Server 11 (x86_64)

   From /etc/*release* /etc/*version*
      SuSE-release:
         SUSE Linux Enterprise Server 11 (x86_64)
         VERSION = 11
         PATCHLEVEL = 3

   uname -a:
      Linux nid00221 3.0.101-0.46.1_1.0502.8871-cray_gem_c #1 SMP Sat Oct 22
      15:26:43 UTC 2016 x86_64 x86_64 x86_64 GNU/Linux


   SPEC is set to: /N/dc2/projects/hpc/lijunj/SPEC/accel-1.1-run/bigred2
      Filesystem            Type    Size  Used Avail Use% Mounted on
      10.10.0.171@o2ib:/dc2 lustre  5.3P  5.0P  223T  96% /N/dc2

   Cannot run dmidecode; consider saying 'chmod +s /usr/sbin/dmidecode'

   (End of data from sysinfo program)

   (End of data from sysinfo program)
```

Base Runtime Environment

C benchmarks:

```
    OpenCL Platform: NVIDIA CUDA, OpenCL 1.2 CUDA 7.5.23
    OpenCL Device #0: Tesla K20, v 352.68
```

C++ benchmarks:

```
    OpenCL Platform: NVIDIA CUDA, OpenCL 1.2 CUDA 7.5.23
    OpenCL Device #0: Tesla K20, v 352.68
```

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Base Compiler Invocation

C benchmarks:
gcc

C++ benchmarks:
g++

Base Optimization Flags

C benchmarks:
-O2 -I/opt/nvidia/cudatoolkit7.5/7.5.18-1.0502.10743.2.1/include
-L/opt/nvidia/cudatoolkit7.5/7.5.18-1.0502.10743.2.1/lib64 -lOpenCL

C++ benchmarks:
-O2 -I/opt/nvidia/cudatoolkit7.5/7.5.18-1.0502.10743.2.1/include
-L/opt/nvidia/cudatoolkit7.5/7.5.18-1.0502.10743.2.1/lib64 -lOpenCL

Base Other Flags

C benchmarks:

116.histo: -DSPEC_LOCAL_MEMORY_HEADROOM=1

The flags file that was used to format this result can be browsed at
http://www.spec.org/accel/flags/flags-advanced.20170426.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/accel/flags/flags-advanced.20170426.xml

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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