SPEC ACCEL™ OCL Result

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Cray
(Test Sponsor: Indiana University)

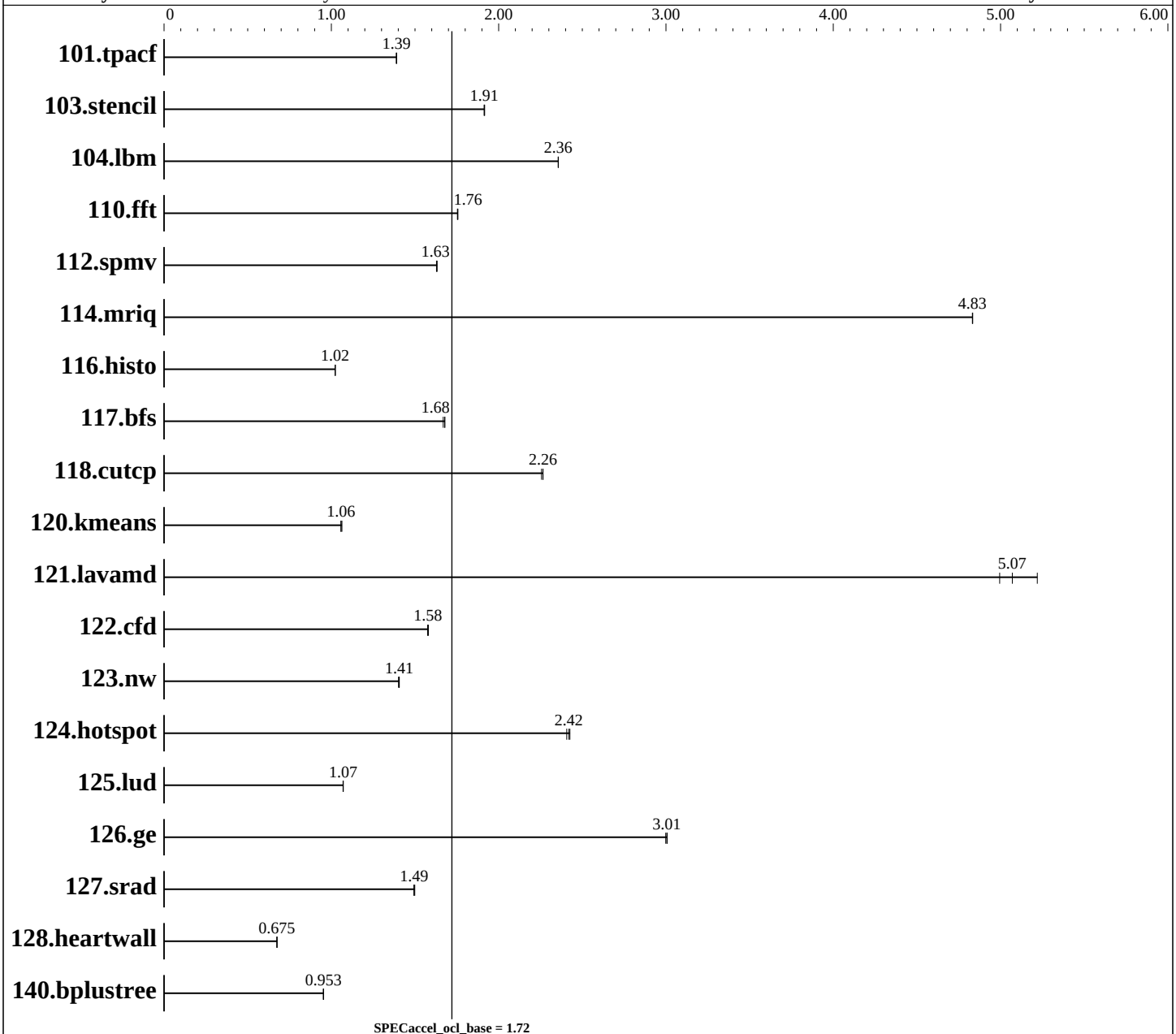
NVIDIA Tesla K20
Cray XK7

SPECaccel_ocl_peak = Not Run

SPECaccel_ocl_base = 1.72

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:	PGI Accelerator Fortran/C/C++ Server, Release 17.1
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**	77.1	1.39	77.0	1.39						
103.stencil	65.2	1.92	65.3	1.91	**65.3**	**1.91**						
104.lbm	47.5	2.36	**47.5**	**2.36**	47.5	2.36						
110.fft	**63.2**	**1.76**	63.3	1.75	63.2	1.76						
112.spmv	**90.2**	**1.63**	90.3	1.63	90.1	1.63						
114.mriq	22.6	4.83	22.6	4.83	**22.6**	**4.83**						
116.histo	**111**	**1.02**	111	1.02	111	1.02						
117.bfs	69.7	1.68	**69.7**	**1.68**	70.1	1.67						
118.cutcp	43.7	2.27	**43.7**	**2.26**	43.9	2.26						
120.kmeans	**94.5**	**1.06**	94.1	1.06	94.6	1.06						
121.lavamd	**21.5**	**5.07**	20.9	5.22	21.8	4.99						
122.cfd	**79.9**	**1.58**	79.8	1.58	80.0	1.58						
123.nw	81.8	1.41	**81.8**	**1.41**	82.1	1.40						
124.hotspot	**47.1**	**2.42**	47.0	2.43	47.4	2.41						
125.lud	**111**	**1.07**	111	1.07	111	1.07						
126.ge	51.5	3.01	**51.6**	**3.01**	51.7	3.00						
127.srad	76.1	1.50	76.3	1.49	**76.3**	**1.49**						
128.heartwall	**157**	**0.675**	157	0.675	157	0.675						
140.bplustree	113	0.952	113	0.953	**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 15:56:31 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  222T  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:
pgcc

C++ benchmarks:
pgc++

Base Portability Flags

118.cutcp: -D__GNUC__

Base Optimization Flags

C benchmarks:
-fast -ta=tesla:cc35 -ta=tesla:cuda7.5 -Mfprelaxed

C++ benchmarks:
-fast -ta=tesla:cc35 -ta=tesla:cuda7.5 -Mfprelaxed

Base Other Flags

C benchmarks (except as noted below):
-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

116.histo: -DSPEC_LOCAL_MEMORY_HEADROOM=1
-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:
-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

The flags file that was used to format this result can be browsed at
http://www.spec.org/accel/flags/pgi2017_flags.20170426.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/accel/flags/pgi2017_flags.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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