



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

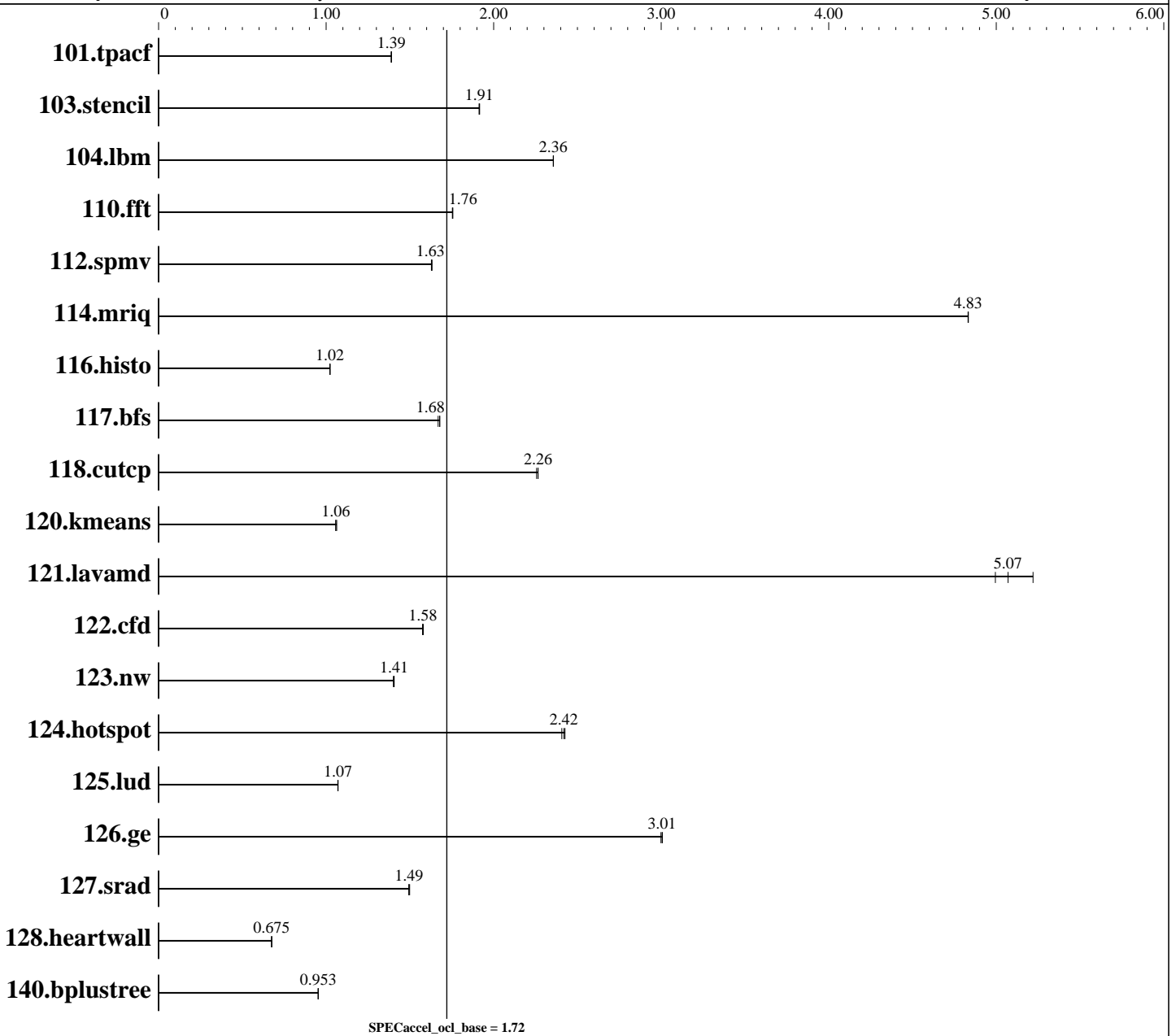
Test sponsor: Indiana University

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

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__GNU__

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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