



# SPEC ACCEL™ OCL Result

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Cray

(Test Sponsor: Indiana University)

## NVIDIA Tesla K20

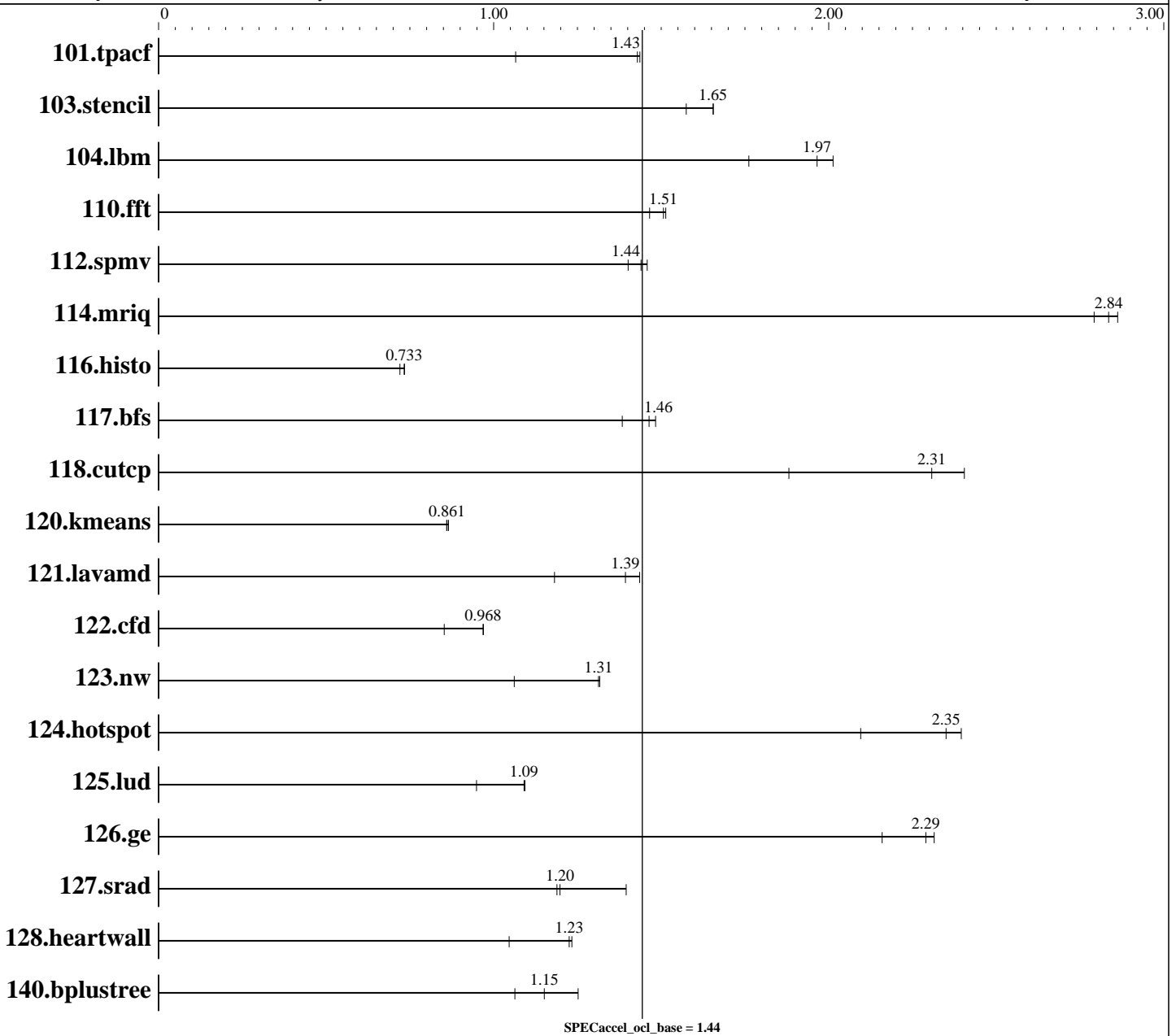
## Cray XK7

SPECaccel\_ocl\_peak = Not Run

SPECaccel\_ocl\_base = 1.44

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

Test date: May-2015  
Hardware Availability: Apr-2013  
Software Availability: Jul-2014





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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 319.82

### Software

**Operating System:** SUSE Linux Enterprise Server 11 (x86\_64), Cray Linux Environment 4.2  
SUSE Linux Enterprise Server 11 (x86\_64)  
2.6.32.59-0.7.1\_1.0402.7496-cray\_gem\_c  
**Compiler:** GNU Fortran (GCC) 4.9.2  
**File System:** NFSv3 (IBM N5500 NAS) over Gb ethernet  
**System State:** Multi-user, run level 3  
**Other Software:** NVIDIA CUDA 5.5.51



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## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
101.tpacf	<u>74.9</u>	<u>1.43</u>	74.5	1.44	100	1.07						
103.stencil	<u>75.5</u>	<u>1.65</u>	75.5	1.66	79.4	1.57						
104.lbm	55.6	2.01	<u>57.0</u>	<u>1.97</u>	63.6	1.76						
110.fft	<u>73.7</u>	<u>1.51</u>	73.3	1.51	75.7	1.47						
112.spmv	<u>102</u>	<u>1.44</u>	101	1.46	105	1.40						
114.mriq	<u>38.4</u>	<u>2.84</u>	39.0	2.79	38.1	2.86						
116.histo	<u>156</u>	<u>0.733</u>	158	0.720	155	0.734						
117.bfs	78.9	1.48	84.5	1.38	<u>79.9</u>	<u>1.46</u>						
118.cutcp	41.2	2.40	52.6	1.88	<u>42.9</u>	<u>2.31</u>						
120.kmeans	116	0.865	<u>116</u>	<u>0.861</u>	116	0.860						
121.lavamd	92.2	1.18	<u>78.2</u>	<u>1.39</u>	75.9	1.44						
122.cfd	130	0.970	148	0.852	<u>130</u>	<u>0.968</u>						
123.nw	87.3	1.32	108	1.06	<u>87.6</u>	<u>1.31</u>						
124.hotspot	<u>48.5</u>	<u>2.35</u>	54.4	2.10	47.6	2.40						
125.lud	109	1.09	125	0.949	<u>109</u>	<u>1.09</u>						
126.ge	<u>67.7</u>	<u>2.29</u>	71.8	2.16	67.0	2.31						
127.srad	95.9	1.19	81.7	1.40	<u>95.2</u>	<u>1.20</u>						
128.heartwall	<u>86.5</u>	<u>1.23</u>	101	1.05	85.9	1.23						
140.bplustree	86.3	1.25	102	1.06	<u>93.8</u>	<u>1.15</u>						

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

## Platform Notes

```
Sysinfo program /N/soft/mason/specaccel-1.0/Docs/sysinfo
$Rev: 6874 $ $Date:: 2013-11-20 #$ 0953404ef7e75a5f9bbb534c6de3f831
running on nid00365 Tue May 12 14:33:46 2015
```

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
caution.)
```

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## Platform Notes (Continued)

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

```
From /proc/meminfo
MemTotal:      33084648 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 = 1
mazama-release:
Mazama Wed Aug 28 02:06:30 CDT 2013 on hssbld0 by bwdev
lsb-cray-mazama-7.1.0
```

```
uname -a:
Linux nid00365 2.6.32.59-0.7.1_1.0402.7496-cray_gem_c #1 SMP Fri Mar 27
21:58:55 UTC 2015 x86_64 x86_64 x86_64 GNU/Linux
```

```
SPEC is set to: /N/soft/mason/specaccel-1.0
Filesystem      Type  Size  Used Avail Use% Mounted on
/N/soft          dvs   599T  121T  478T  21% /N/soft
```

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

(End of data from sysinfo program)

## Base Runtime Environment

### C benchmarks:

OpenCL Platform: NVIDIA CUDA, OpenCL 1.1 CUDA 4.2.1  
OpenCL Device #0: Tesla K20, v 319.82

### C++ benchmarks:

OpenCL Platform: NVIDIA CUDA, OpenCL 1.1 CUDA 4.2.1  
OpenCL Device #0: Tesla K20, v 319.82



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## Base Compiler Invocation

C benchmarks:  
gcc

C++ benchmarks:  
g++

## Base Optimization Flags

C benchmarks:  
-O2 -I/opt/nvidia/cudatoolkit/default/include  
-L/opt/cray/nvidia/default/lib64 -lcuda -lOpenCL

C++ benchmarks:  
-O2 -I/opt/nvidia/cudatoolkit/default/include  
-L/opt/cray/nvidia/default/lib64 -lcuda -lOpenCL

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

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

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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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