



SPEC ACCEL™ OCL Result

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Supermicro

(Test Sponsor: HZDR)

NVIDIA Tesla K20m

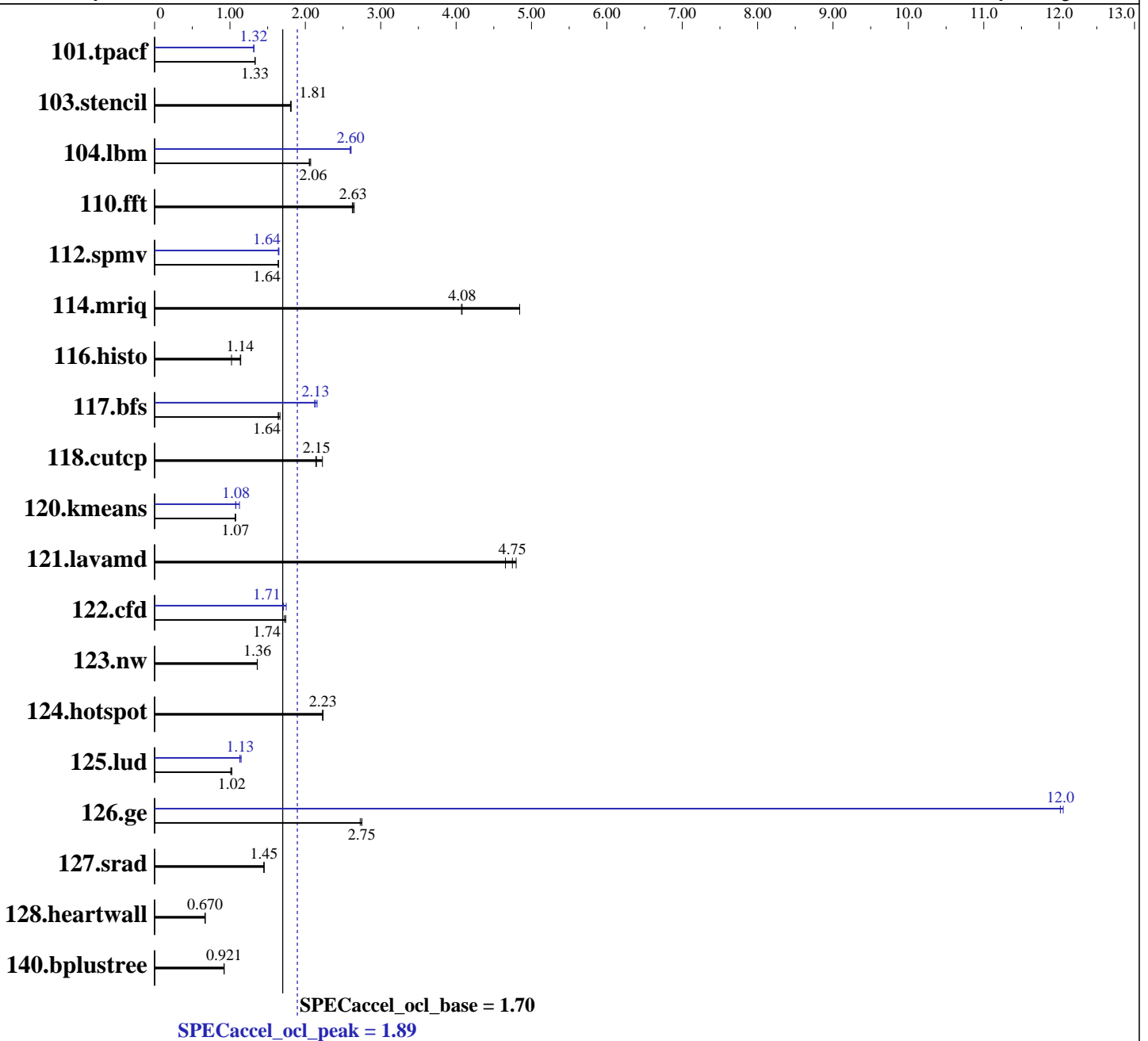
Supermicro X9DRG-HF

SPECaccel_ocl_peak = 1.89

SPECaccel_ocl_base = 1.70

ACCEL license: 65A
Test sponsor: HZDR
Tested by: HZDR

Test date: Aug-2017
Hardware Availability: Jan-2013
Software Availability: Aug-2016





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Hardware

CPU Name: Intel Xeon E5-2609
CPU Characteristics: No TURBO
CPU MHz: 2400
CPU MHz Maximum: 2400
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip
CPU(s) orderable: 1,2 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core
L3 Cache: 10 MB I+D on chip per chip
Other Cache: None
Memory: 64 GB (8 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1066MHz)
Disk Subsystem: 60 GB INTEL SSDSC2CW060A3
Other Hardware: None

Accelerator

Accel Model Name: Tesla K20m
Accel Vendor: NVIDIA
Accel Name: NVIDIA Tesla K20m
Type of Accel: GPU
Accel Connection: PCIe 2.0 16x
Does Accel Use ECC: yes
Accel Description: NVIDIA Tesla K20m, 2688 CUDA cores, 732 MHz 6 GB GDDR5 RAM (Kepler Generation)
Accel Driver: NVIDIA UNIX x86_64 Kernel Module 367.48

Software

Operating System: Ubuntu 14.04.5 LTS
Ubuntu 14.04.5 LTS
4.4.0-38-generic
Compiler: GNU Compiler C/C++ Version 6.2.0
File System: ext3
System State: Run level 5 (user-level)
Other Software: NVIDIA Cuda SDK 7.0, driver version 367.48



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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
101.tpacf	80.3	1.33	80.2	1.33	80.4	1.33	81.1	1.32	81.4	1.31	81.3	1.32
103.stencil	69.1	1.81	69.1	1.81	69.3	1.80	69.1	1.81	69.1	1.81	69.3	1.80
104.lbm	54.6	2.05	54.1	2.07	54.4	2.06	43.1	2.60	43.0	2.61	43.2	2.59
110.fft	42.2	2.63	41.9	2.65	42.3	2.62	42.2	2.63	41.9	2.65	42.3	2.62
112.spmv	89.6	1.64	89.5	1.64	89.5	1.64	89.5	1.64	89.5	1.64	89.1	1.65
114.mriq	26.7	4.08	22.5	4.84	26.8	4.07	26.7	4.08	22.5	4.84	26.8	4.07
116.histo	100	1.14	112	1.02	99.7	1.14	100	1.14	112	1.02	99.7	1.14
117.bfs	70.3	1.66	71.3	1.64	71.3	1.64	54.8	2.13	55.1	2.12	54.3	2.16
118.cutcp	46.1	2.15	46.3	2.14	44.5	2.23	46.1	2.15	46.3	2.14	44.5	2.23
120.kmeans	93.1	1.07	93.6	1.07	93.1	1.07	92.7	1.08	88.8	1.13	93.0	1.08
121.lavamd	22.7	4.80	23.4	4.65	23.0	4.75	22.7	4.80	23.4	4.65	23.0	4.75
122.cfd	72.4	1.74	73.2	1.72	72.4	1.74	72.2	1.75	73.8	1.71	73.7	1.71
123.nw	84.4	1.36	84.4	1.36	84.5	1.36	84.4	1.36	84.4	1.36	84.5	1.36
124.hotspot	51.2	2.23	51.0	2.24	51.0	2.23	51.2	2.23	51.0	2.24	51.0	2.23
125.lud	118	1.01	116	1.02	116	1.02	105	1.13	104	1.15	105	1.13
126.ge	56.8	2.73	56.4	2.75	56.4	2.75	12.9	12.0	12.9	12.1	12.9	12.0
127.srad	78.6	1.45	78.5	1.45	78.6	1.45	78.6	1.45	78.5	1.45	78.6	1.45
128.heartwall	158	0.670	158	0.670	158	0.671	158	0.670	158	0.670	158	0.671
140.bplustree	117	0.923	117	0.921	117	0.921	117	0.923	117	0.921	117	0.921

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

Platform Notes

```
Sysinfo program /tmp/spec/1.2/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #$ c05a7f14b1b1765e3fe1df68447e8a35
running on kepler002 Thu Aug 24 13:13:30 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 : Intel(R) Xeon(R) CPU E5-2609 0 @ 2.40GHz
 2 "physical id"s (chips)
 8 "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 : 4
siblings : 4
physical 0: cores 0 1 2 3
physical 1: cores 0 1 2 3
cache size : 10240 KB
```

```
From /proc/meminfo
MemTotal:      65949360 kB
HugePages_Total: 0
Hugepagesize:  2048 kB
```

```
/usr/bin/lsb_release -d
Ubuntu 14.04.5 LTS
```

```
From /etc/*release* /etc/*version*
debian_version: jessie/sid
os-release:
NAME="Ubuntu"
VERSION="14.04.5 LTS, Trusty Tahr"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 14.04.5 LTS"
VERSION_ID="14.04"
HOME_URL="http://www.ubuntu.com/"
SUPPORT_URL="http://help.ubuntu.com/"
redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
rh-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
```

```
uname -a:
Linux kepler002 4.4.0-38-generic #57~14.04.1-Ubuntu SMP Tue Sep 6 17:20:43
UTC 2016 x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 5 Jan 23 15:07
```

```
SPEC is set to: /tmp/spec/1.2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdal        ext3  30G   14G   15G   47% /
```

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 1.2 CUDA 8.0.44
OpenCL Device #0: Tesla K20m, v 367.48

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Base Runtime Environment (Continued)

C++ benchmarks:

OpenCL Platform: NVIDIA CUDA, OpenCL 1.2 CUDA 8.0.44
OpenCL Device #0: Tesla K20m, v 367.48

Base Compiler Invocation

C benchmarks:

gcc

C++ benchmarks:

g++

Base Portability Flags

116.histo: -DSPEC_LOCAL_MEMORY_HEADROOM=2
122.cfd: -std=gnu++98

Base Optimization Flags

C benchmarks:

-O2 -I/opt/pkg/devel/cuda/7.0/include -L/opt/pkg/devel/cuda/7.0/libb64
-lOpenCL

C++ benchmarks:

-O2 -I/opt/pkg/devel/cuda/7.0/include -L/opt/pkg/devel/cuda/7.0/libb64
-lOpenCL

Peak Runtime Environment

C benchmarks:

OpenCL Platform: NVIDIA CUDA, OpenCL 1.2 CUDA 8.0.44
OpenCL Device #0: Tesla K20m, v 367.48

C++ benchmarks:

OpenCL Platform: NVIDIA CUDA, OpenCL 1.2 CUDA 8.0.44
OpenCL Device #0: Tesla K20m, v 367.48



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Peak Compiler Invocation

C benchmarks:
gcc

C++ benchmarks:
g++

Peak Portability Flags

116.histo: -DSPEC_LOCAL_MEMORY_HEADROOM=2
122.cfd: -std=gnu++98

Peak Optimization Flags

C benchmarks:

110.ft: basepeak = yes

114.mriq: basepeak = yes

116.histo: basepeak = yes

117.bfs: -O2 -DSPEC_ACCEL_WG_SIZE_0_0=64 -DSPEC_ACCEL_WG_SIZE_1_0=64
-I/opt/pkg/devel/cuda/7.0/include
-L/opt/pkg/devel/cuda/7.0/lib64 -lOpenCL

118.cutcp: basepeak = yes

121.lavamd: basepeak = yes

124.hotspot: basepeak = yes

127.srad: basepeak = yes

128.heartwall: basepeak = yes

140.bplustree: basepeak = yes

C++ benchmarks:

101.tpacf: -O2 -DSPEC_ACCEL_WG_SIZE_0_0=1024
-I/opt/pkg/devel/cuda/7.0/include
-L/opt/pkg/devel/cuda/7.0/lib64 -lOpenCL

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Peak Optimization Flags (Continued)

103.stencil: basepeak = yes

104.lbm: -O2 -DSPEC_ACCEL_WG_SIZE_0_0=32 -DSPEC_ACCEL_WG_SIZE_0_1=1
-DSPEC_ACCEL_WG_SIZE_0_2=1 -I/opt/pkg/devel/cuda/7.0/include
-L/opt/pkg/devel/cuda/7.0/libb64 -lOpenCL

112.spmv: -O2 -DSPEC_ACCEL_WG_SIZE_0_0=96
-I/opt/pkg/devel/cuda/7.0/include
-L/opt/pkg/devel/cuda/7.0/libb64 -lOpenCL

120.kmeans: -O2 -DSPEC_ACCEL_WG_SIZE_0_0=288
-I/opt/pkg/devel/cuda/7.0/include
-L/opt/pkg/devel/cuda/7.0/libb64 -lOpenCL

122.cfd: -O2 -DSPEC_ACCEL_WG_SIZE_3_0=288
-I/opt/pkg/devel/cuda/7.0/include
-L/opt/pkg/devel/cuda/7.0/libb64 -lOpenCL

123.nw: basepeak = yes

125.lud: -O2 -DSPEC_ACCEL_WG_SIZE_0_0=32
-I/opt/pkg/devel/cuda/7.0/include
-L/opt/pkg/devel/cuda/7.0/libb64 -lOpenCL

126.ge: -O2 -DSPEC_ACCEL_WG_SIZE_0_0=512 -DSPEC_ACCEL_WG_SIZE_1_0=1
-DSPEC_ACCEL_WG_SIZE_1_1=512
-I/opt/pkg/devel/cuda/7.0/include
-L/opt/pkg/devel/cuda/7.0/libb64 -lOpenCL

The flags file that was used to format this result can be browsed at

<https://www.spec.org/accel/flags/flags-advanced.20170929.html>

You can also download the XML flags source by saving the following link:

<https://www.spec.org/accel/flags/flags-advanced.20170929.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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