### SPEC ACCEL™ ACC Result

**Supermicro**  
(Test Sponsor: NVIDIA Corporation)

**Tesla K40m**  
SuperServer 1028GR-TR

<table>
<thead>
<tr>
<th>Test Sponsor</th>
<th>NVIDIA Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test date</td>
<td>May-2017</td>
</tr>
</tbody>
</table>

**ACCEL license:** 019  
**Tested by:** NVIDIA Corporation  
**Hardware Availability:** Oct-2015  
**Software Availability:** May-2017

<table>
<thead>
<tr>
<th>Test</th>
<th>Time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>303.ostencil</td>
<td>2.48</td>
</tr>
<tr>
<td>304.olbm</td>
<td>1.97</td>
</tr>
<tr>
<td>314.omriq</td>
<td>2.45</td>
</tr>
<tr>
<td>350.md</td>
<td>2.11</td>
</tr>
<tr>
<td>351.palm</td>
<td>1.96</td>
</tr>
<tr>
<td>352.ep</td>
<td>1.47</td>
</tr>
<tr>
<td>353.clvrleaf</td>
<td>2.76</td>
</tr>
<tr>
<td>354.cg</td>
<td>2.62</td>
</tr>
<tr>
<td>355.seismic</td>
<td>2.78</td>
</tr>
<tr>
<td>356.sp</td>
<td>2.41</td>
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<tr>
<td>357.csp</td>
<td>3.27</td>
</tr>
<tr>
<td>359.miniGhost</td>
<td>3.03</td>
</tr>
<tr>
<td>360.ilbdc</td>
<td>3.02</td>
</tr>
<tr>
<td>363.swim</td>
<td>2.52</td>
</tr>
<tr>
<td>370.bt</td>
<td>5.13</td>
</tr>
</tbody>
</table>

**SPECaccel_acc_base = 2.56**  
**SPECaccel_acc_peak = 2.56**

### Hardware

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon E5-2698 v3</td>
</tr>
<tr>
<td>CPU Characteristics</td>
<td>32 cores, 2 chips, 16 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU MHz</td>
<td>2300</td>
</tr>
<tr>
<td>CPU MHz Maximum</td>
<td>3600</td>
</tr>
<tr>
<td>FPU</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>32 cores, 2 chips, 16 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>1,2 chips</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB L1 + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>256 KB L1+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache</td>
<td>40 MB L1+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache</td>
<td>None</td>
</tr>
</tbody>
</table>

### Accelerator

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accel Model Name</td>
<td>Tesla K40</td>
</tr>
<tr>
<td>Accel Vendor</td>
<td>NVIDIA Corporation</td>
</tr>
<tr>
<td>Accel Name</td>
<td>Tesla K40m</td>
</tr>
<tr>
<td>Type of Accel</td>
<td>GPU</td>
</tr>
<tr>
<td>Accel Connection</td>
<td>PCIe</td>
</tr>
<tr>
<td>Does Accel Use ECC</td>
<td>Yes</td>
</tr>
<tr>
<td>Accel Description</td>
<td>See Notes</td>
</tr>
<tr>
<td>Accel Driver</td>
<td>NVIDIA UNIX x86_64 Kernel Module 375.20</td>
</tr>
</tbody>
</table>

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Tesla K40m
SuperServer 1028GR-TR

SPECaccel_acc_peak = 2.56
SPECaccel_acc_base = 2.56

ACEL license: 019
Test sponsor: NVIDIA Corporation
Tested by: NVIDIA Corporation

Hardware (Continued)
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)
Disk Subsystem: 500 GB Seagate ST9500620NS 7200 RPM SATA
Other Hardware: None

Software
Operating System: CentOS Linux release 7.2.1511 (Core)
3.10.0-327.22.2.el7.x86_64
File System: xfs
System State: Run level 3 (multi-user)
Other Software: None

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base</th>
<th>Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seconds</td>
<td>Ratio</td>
</tr>
<tr>
<td>303.ostencil</td>
<td>58.8</td>
<td>2.47</td>
</tr>
<tr>
<td>304.olbm</td>
<td>231</td>
<td>1.97</td>
</tr>
<tr>
<td>314.omriq</td>
<td>391</td>
<td>2.45</td>
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<tr>
<td>350.md</td>
<td>120</td>
<td>2.11</td>
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<tr>
<td>351.palm</td>
<td>189</td>
<td>1.96</td>
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<tr>
<td>352.ep</td>
<td>360</td>
<td>1.47</td>
</tr>
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<td>355.seismic</td>
<td>133</td>
<td>2.77</td>
</tr>
<tr>
<td>356.sp</td>
<td>114</td>
<td>2.41</td>
</tr>
<tr>
<td>357.esp</td>
<td>82.6</td>
<td>3.27</td>
</tr>
<tr>
<td>359.miniGhost</td>
<td>122</td>
<td>3.03</td>
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<tr>
<td>360.ilbdc</td>
<td>122</td>
<td>3.02</td>
</tr>
<tr>
<td>363.swim</td>
<td>90.4</td>
<td>2.55</td>
</tr>
<tr>
<td>370.bt</td>
<td>43.4</td>
<td>5.13</td>
</tr>
</tbody>
</table>

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

Operating System Notes

Stacksize set to 'unlimited'
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SPECaccel_acc_base = 2.56

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<table>
<thead>
<tr>
<th>Hardware Availability</th>
<th>Software Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct-2015</td>
<td>May-2017</td>
</tr>
</tbody>
</table>

Test date: May-2017

Platform Notes

Sysinfo program /local/home/colgrove/SPECACCEL/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #$ c05a7f14b1b1765e3fe1df68447e8a35
running on hsw8 Wed May 10 13:11:00 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 E5-2698 v3 @ 2.30GHz
2 "physical id"s (chips)
64 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 16
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
cache size : 40960 KB

From /proc/meminfo
MemTotal: 264038532 kB
HugePages_Total: 20
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
CentOS Linux release 7.2.1511 (Core)

From /etc/*release* /etc/*version*
centos-release: CentOS Linux release 7.2.1511 (Core)
centos-release-upstream: Derived from Red Hat Enterprise Linux 7.2 (Source)

os-release:
NAME="CentOS Linux"
VERSION="7 (Core)"
ID="centos"
ID_LIKE="rhel fedora"
VERSION_ID="7"
PRETTY_NAME="CentOS Linux 7 (Core)"
ANSI_COLOR="0;31"
CPE_NAME=cpe:/o:centos:centos:7
redhat-release: CentOS Linux release 7.2.1511 (Core)
system-release: CentOS Linux release 7.2.1511 (Core)
system-release-cpe: cpe:/o:centos:centos:7

uname -a:
Linux hsw8 3.10.0-327.22.2.e17.x86_64 #1 SMP Thu Jun 23 17:05:11 UTC 2016
x86_64 x86_64 x86_64 GNU/Linux

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Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/

SPEC ACCEL ACC Result

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SPECaccel_acc_peak = 2.56
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Hardware Availability: Oct-2015

Platform Notes (Continued)

run-level 3 May 10 10:51

SPEC is set to: /local/home/colgrove/SPECACCEL

Filesystem              Type  Size  Used Avail Use% Mounted on
/dev/mapper/centos-root xfs   443G   29G  414G   7% /

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

(End of data from sysinfo program)

Information from pgaccelinfo

CUDA Driver Version: 8000
NVRM version: NVIDIA UNIX x86_64 Kernel Module 375.20 Tue Nov 15 16:49:10 PST 2016

Device Number: 0
Device Name: Tesla K40m
Device Revision Number: 3.5
Global Memory Size: 12029132800
Number of Multiprocessors: 15
Number of SP Cores: 2880
Number of DP Cores: 960
Concurrent Copy and Execution: Yes
Total Constant Memory: 65536
Total Shared Memory per Block: 49152
Registers per Block: 65536
Warp Size: 32
Maximum Threads per Block: 1024
Maximum Block Dimensions: 1024, 1024, 64
Maximum Grid Dimensions: 2147483647 x 65535 x 65535
Maximum Memory Pitch: 2147483647B
Texture Alignment: 512B
Clock Rate: 745 MHz
Execution Timeout: No
Integrated Device: No
Can Map Host Memory: Yes
Compute Mode: default
Concurrent Kernels: Yes
ECC Enabled: Yes
Memory Clock Rate: 3004 MHz
Memory Bus Width: 384 bits
L2 Cache Size: 1572864 bytes
Max Threads Per SMP: 2048
Async Engines: 2
Unified Addressing: Yes
Managed Memory: Yes
PGI Compiler Option: -ta=tesla:cc35
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Base Compiler Invocation

C benchmarks:
pgcc

Fortran benchmarks:
pgfortran

Benchmarks using both Fortran and C:
pgcc pgfortran

Base Optimization Flags

C benchmarks:
-fast -Mfprelaxed -acc -ta=tesla:cc35 -ta=tesla:cuda8.0

Fortran benchmarks:
-fast -Mfprelaxed -acc -ta=tesla:cc35 -ta=tesla:cuda8.0

Benchmarks using both Fortran and C:
353.clvrleaf: -fast -Mfprelaxed -acc -ta=tesla:cc35 -ta=tesla:cuda8.0

Peak Optimization Flags

C benchmarks:
303.ostencil: basepeak = yes
304.olbm: basepeak = yes
314.omriq: basepeak = yes
352.ep: basepeak = yes
354.cg: basepeak = yes
357.csp: basepeak = yes
370.bt: basepeak = yes

Fortran benchmarks:

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**SPECaccel_acc_peak = 2.56**

**SPECaccel_acc_base = 2.56**

Peak Optimization Flags (Continued)

- 350.md: basepeak = yes
- 351.palm: basepeak = yes
- 355.seismic: basepeak = yes
- 356.sp: basepeak = yes
- 360.ilbdc: basepeak = yes
- 363.swim: basepeak = yes

Benchmarks using both Fortran and C:

- 353.clvrleaf: basepeak = yes
- 359.miniGhost: basepeak = yes

The flags file that was used to format this result can be browsed at  
https://www.spec.org/accel/flags/pgi2017_flags.20170621.00.html

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

https://www.spec.org/accel/flags/pgi2017_flags.20170621.00.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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