SPEC ACCEL™ ACC Result

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Supermicro
(Test Sponsor: NVIDIA Corporation)

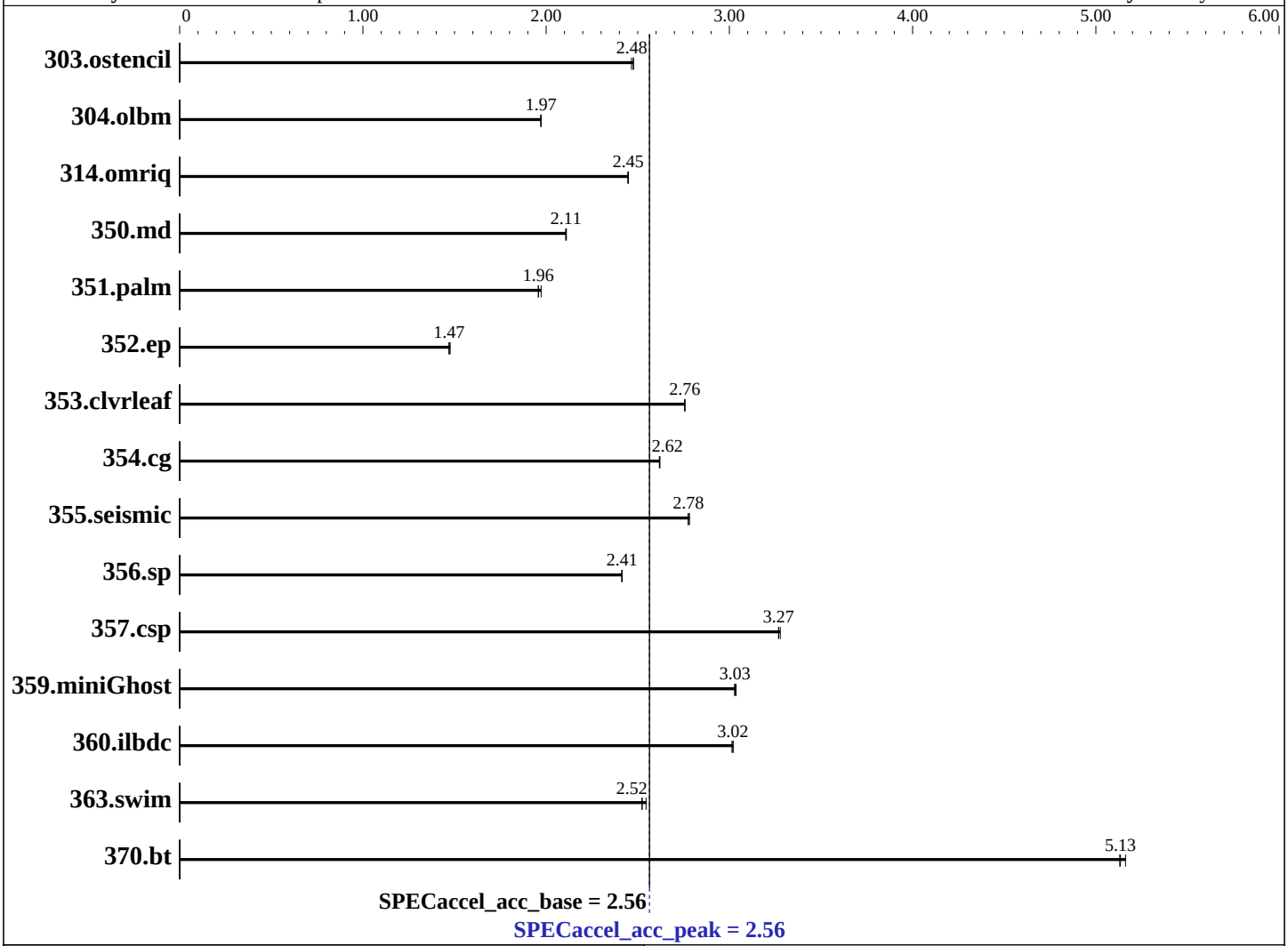
Tesla K40m
SuperServer 1028GR-TR

SPECaccel_acc_peak = 2.56

SPECaccel_acc_base = 2.56

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

Test date: May-2017
Hardware Availability: Oct-2015
Software Availability: May-2017



Hardware

CPU Name:	Intel Xeon E5-2698 v3
CPU Characteristics:	
CPU MHz:	2300
CPU MHz Maximum:	3600
FPU:	Integrated
CPU(s) enabled:	32 cores, 2 chips, 16 cores/chip, 2 threads/core
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:	40 MB I+D on chip per chip
Other Cache:	None

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Accelerator

Accel Model Name:	Tesla K40
Accel Vendor:	NVIDIA Corporation
Accel Name:	Tesla K40m
Type of Accel:	GPU
Accel Connection:	PCIe
Does Accel Use ECC:	Yes
Accel Description:	See Notes
Accel Driver:	NVIDIA UNIX x86_64 Kernel Module 375.20

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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
Compiler: PGI Professional Edition, Release 17.5
File System: xfs
System State: Run level 3 (multi-user)
Other Software: None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
303.ostencil	58.8	2.47	**58.6**	**2.48**	58.6	2.48	58.8	2.47	**58.6**	**2.48**	58.6	2.48
304.olbm	**231**	**1.97**	231	1.97	231	1.97	**231**	**1.97**	231	1.97	231	1.97
314.omriq	**391**	**2.45**	390	2.45	391	2.45	**391**	**2.45**	390	2.45	391	2.45
350.md	120	2.11	**120**	**2.11**	119	2.11	120	2.11	**120**	**2.11**	119	2.11
351.palm	**189**	**1.96**	189	1.96	188	1.97	**189**	**1.96**	189	1.96	188	1.97
352.ep	**360**	**1.47**	359	1.48	361	1.47	**360**	**1.47**	359	1.48	361	1.47
353.clvrleaf	161	2.76	161	2.76	**161**	**2.76**	161	2.76	161	2.76	**161**	**2.76**
354.cg	156	2.62	156	2.62	**156**	**2.62**	156	2.62	156	2.62	**156**	**2.62**
355.seismic	133	2.77	133	2.78	**133**	**2.78**	133	2.77	133	2.78	**133**	**2.78**
356.sp	**114**	**2.41**	114	2.41	114	2.41	**114**	**2.41**	114	2.41	114	2.41
357.csp	**82.6**	**3.27**	82.4	3.28	82.6	3.27	**82.6**	**3.27**	82.4	3.28	82.6	3.27
359.miniGhost	**122**	**3.03**	122	3.03	122	3.04	**122**	**3.03**	122	3.03	122	3.04
360.ilbdc	**122**	**3.02**	122	3.01	122	3.02	**122**	**3.02**	122	3.01	122	3.02
363.swim	90.4	2.55	**91.1**	**2.52**	91.2	2.52	90.4	2.55	**91.1**	**2.52**	91.2	2.52
370.bt	**43.4**	**5.13**	43.5	5.13	43.2	5.16	**43.4**	**5.13**	43.5	5.13	43.2	5.16

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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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.el7.x86_64 #1 SMP Thu Jun 23 17:05:11 UTC 2016
   x86_64 x86_64 x86_64 GNU/Linux
```

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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

359.miniGhost: -fast -Mfprelaxed -acc -ta=tesla:cc35 -ta=tesla:cuda8.0 -Mnomain

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:

Continued on next page

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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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