SPEC ACCEL™ ACC Result

2014-2016 Standard Performance Evaluation Corporation

IBM Corporation
(Test Sponsor: NVIDIA Corporation)

Tesla P100

IBM Power Systems S822LC for High Performance Computing (8335-GTB)

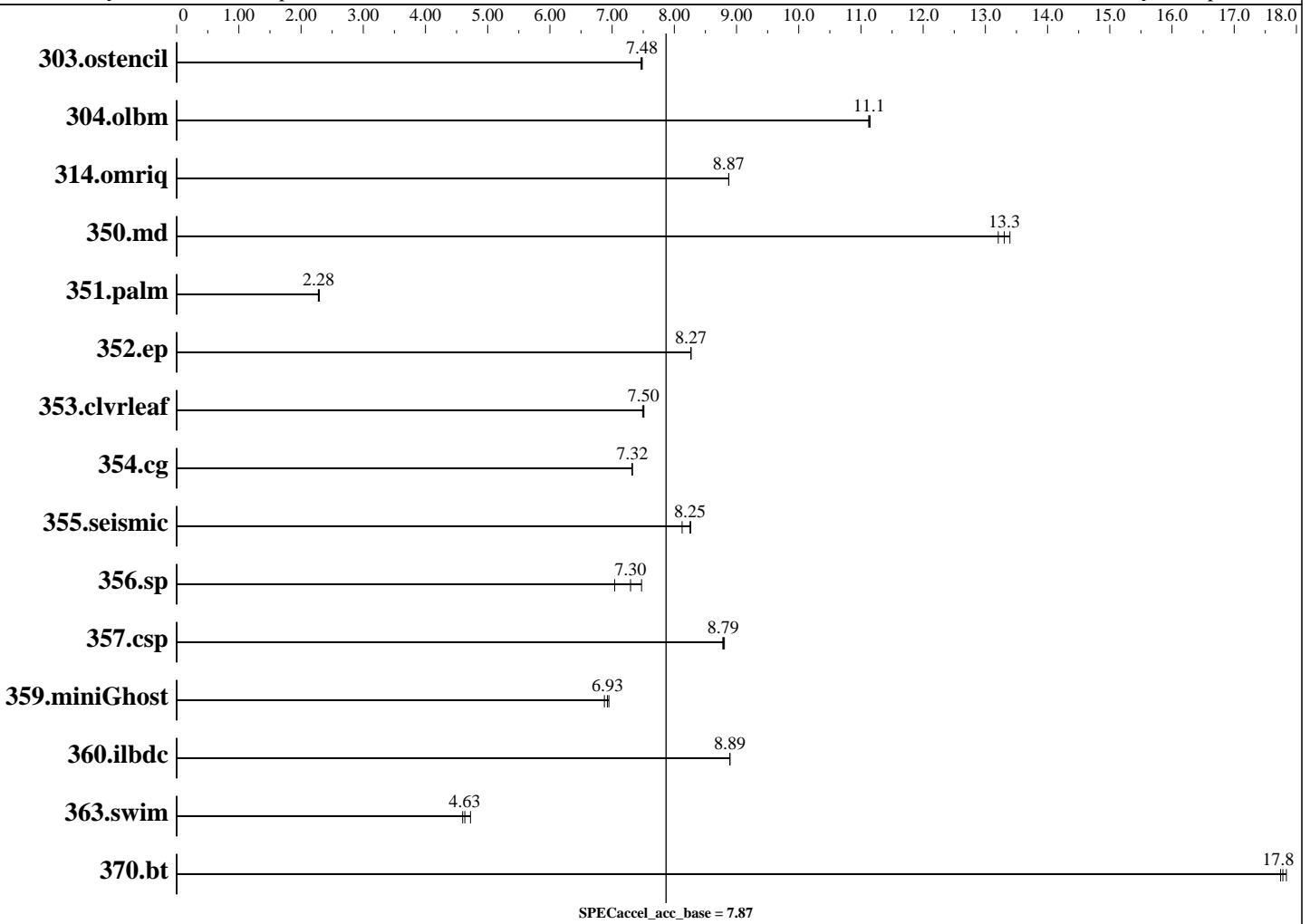$SPECaccel\_acc\_peak =$ Not Run

$SPECaccel\_acc\_base =$ 7.87

ACCEL license:	019	**Test date:**	Sep-2016
Test sponsor:	NVIDIA Corporation	**Hardware Availability:**	Sep-2016
Tested by:	IBM Corporation	**Software Availability:**	Sep-2016

Benchmark	Score
303.ostencil	7.48
304.olbm	11.1
314.omriq	8.87
350.md	13.3
351.palm	2.28
352.ep	8.27
353.clvrleaf	7.50
354.cg	7.32
355.seismic	8.25
356.sp	7.30
357.csp	8.79
359.miniGhost	6.93
360.ilbdc	8.89
363.swim	4.63
370.bt	17.8

SPECaccel_acc_base = 7.87

Hardware

CPU Name:	POWER8 with NVLink
CPU Characteristics:	
CPU MHz:	3259
CPU MHz Maximum:	3857
FPU:	Integrated
CPU(s) enabled:	16 cores, 2 chips, 8 cores/chip, 8 threads/core
CPU(s) orderable:	2 chips
Primary Cache:	32 KB I + 64 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	8 MB I+D on chip per chip
Other Cache:	16 MB I+D off chip per 4 DIMMs

Accelerator

Accel Model Name:	Tesla P100
Accel Vendor:	NVIDIA
Accel Name:	Tesla P100
Type of Accel:	GPU
Accel Connection:	NVLink
Does Accel Use ECC:	Yes
Accel Description:	See Notes
Accel Driver:	NVIDIA UNIX ppc64le Kernel Module 361.85

Continued on next page

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

Page 1

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Hardware (Continued)

Memory:	512 GB (16 x 32 GB RDIMMs) DDR4 1600 MHz
Disk Subsystem:	2x 1TB SATA 6.0Gb/s 7200 RPM
Other Hardware:	No

Software

Operating System:	Ubuntu 16.04.1 LTS 4.4.0-34-generic
Compiler:	PGI Accelerator Fortran/C/C++ Server, Release 16.9
File System:	ext4
System State:	Run level 5 (multi-user)
Other Software:	None

Results Table

Benchmark	Base						Peak					
	Seconds	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**
303.ostencil	**19.4**	**7.48**	19.4	7.47	19.4	7.48						
304.olbm	**40.9**	**11.1**	40.9	11.1	40.8	11.1						
314.omriq	108	8.87	108	8.88	**108**	**8.87**						
350.md	18.8	13.4	**18.9**	**13.3**	19.1	13.2						
351.palm	**162**	**2.28**	162	2.28	161	2.29						
352.ep	64.1	8.27	64.1	8.27	**64.1**	**8.27**						
353.clvrleaf	59.2	7.51	59.4	7.49	**59.3**	**7.50**						
354.cg	**55.7**	**7.32**	55.7	7.33	55.7	7.32						
355.seismic	**44.8**	**8.25**	44.8	8.26	45.5	8.13						
356.sp	36.9	7.47	**37.8**	**7.30**	39.2	7.04						
357.csp	**30.7**	**8.79**	30.7	8.81	30.8	8.78						
359.miniGhost	**53.3**	**6.93**	53.1	6.95	53.7	6.88						
360.ilbdc	**41.3**	**8.89**	41.3	8.89	41.3	8.89						
363.swim	50.0	4.60	**49.7**	**4.63**	48.7	4.72						
370.bt	**12.5**	**17.8**	12.6	17.7	12.5	17.8						

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

Submit Notes

```
The config file option 'submit' was used.
```

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Platform Notes

```
Sysinfo program /home/user/SPECACCEL/Docs/sysinfo
$Rev: 6874 $ $Date:: 2013-11-20 #$ 0953404ef7e75a5f9bbb534c6de3f831
running on gar1 Fri Sep  2 21:51:47 2016

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
   clock : 2061.000000MHz
   clock : 2094.000000MHz
   clock : 2360.000000MHz
   clock : 2593.000000MHz
   clock : 2693.000000MHz
   clock : 4023.000000MHz
   machine : PowerNV 8335-GTB
   model : 8335-GTB
   platform : PowerNV
   revision : 1.0 (pvr 004c 0100)
   cpu : POWER8NVL (raw), altivec supported
*
* 0 "physical id" tags found.  Perhaps this is an older system,
* or a virtualized system.  Not attempting to guess how to
* count chips/cores for this system.
*
     128 "processors"
   cores, siblings (Caution: counting these is hw and system dependent.  The
   following excerpts from /proc/cpuinfo might not be reliable.  Use with
   caution.)

From /proc/meminfo
   MemTotal:       535690880 kB
   HugePages_Total:        0
   Hugepagesize:       16384 kB

/usr/bin/lsb_release -d
   Ubuntu 16.04.1 LTS

From /etc/*release* /etc/*version*
   debian_version: stretch/sid
   os-release:
      NAME="Ubuntu"
      VERSION="16.04.1 LTS (Xenial Xerus)"
      ID=ubuntu
      ID_LIKE=debian
      PRETTY_NAME="Ubuntu 16.04.1 LTS"
      VERSION_ID="16.04"
      HOME_URL="http://www.ubuntu.com/"
      SUPPORT_URL="http://help.ubuntu.com/"
```

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Hardware Availability: Sep-2016
Software Availability: Sep-2016

Platform Notes (Continued)

```
uname -a:
   Linux gar1 4.4.0-34-generic #53-Ubuntu SMP Wed Jul 27 16:04:07 UTC 2016
   ppc64le ppc64le ppc64le GNU/Linux

run-level 5 Sep 2 16:36

SPEC is set to: /home/user/SPECACCEL
   Filesystem                 Type  Size  Used Avail Use% Mounted on
   /dev/mapper/g82L--vg-root ext4  788G  232G  517G  31% /

(End of data from sysinfo program)
Information from pgaccelinfo
CUDA Driver Version:           8000
NVRM version:                  NVIDIA UNIX ppc64le Kernel Module  361.85
Device Number:                 0
Device Name:                   Tesla P100-SXM2-16GB
Device Revision Number:        6.0
Global Memory Size:            17071669248
Number of Multiprocessors:     56
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:                    1480 MHz
Execution Timeout:             No
Integrated Device:             No
Can Map Host Memory:           Yes
Compute Mode:                  default
Concurrent Kernels:            Yes
ECC Enabled:                   Yes
Memory Clock Rate:             715 MHz
Memory Bus Width:              4096 bits
L2 Cache Size:                 4194304 bytes
Max Threads Per SMP:           2048
Async Engines:                 3
Unified Addressing:            Yes
Managed Memory:                Yes
PGI Compiler Option:           -ta=tesla:cc60
```

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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 -acc -ta=tesla:cc60
```

Fortran benchmarks:
```
-fast -acc -ta=tesla:cc60
```

Benchmarks using both Fortran and C:

```
353.clvrleaf: -fast -acc -ta=tesla:cc60
```

```
359.miniGhost: -fast -acc -ta=tesla:cc60 -Mnomain
```

The flags file that was used to format this result can be browsed at
http://www.spec.org/accel/flags/pgi2016_flags.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/accel/flags/pgi2016_flags.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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