SPEC ACCEL™ ACC Result

IBM
(Test Sponsor: NVIDIA Corporation)

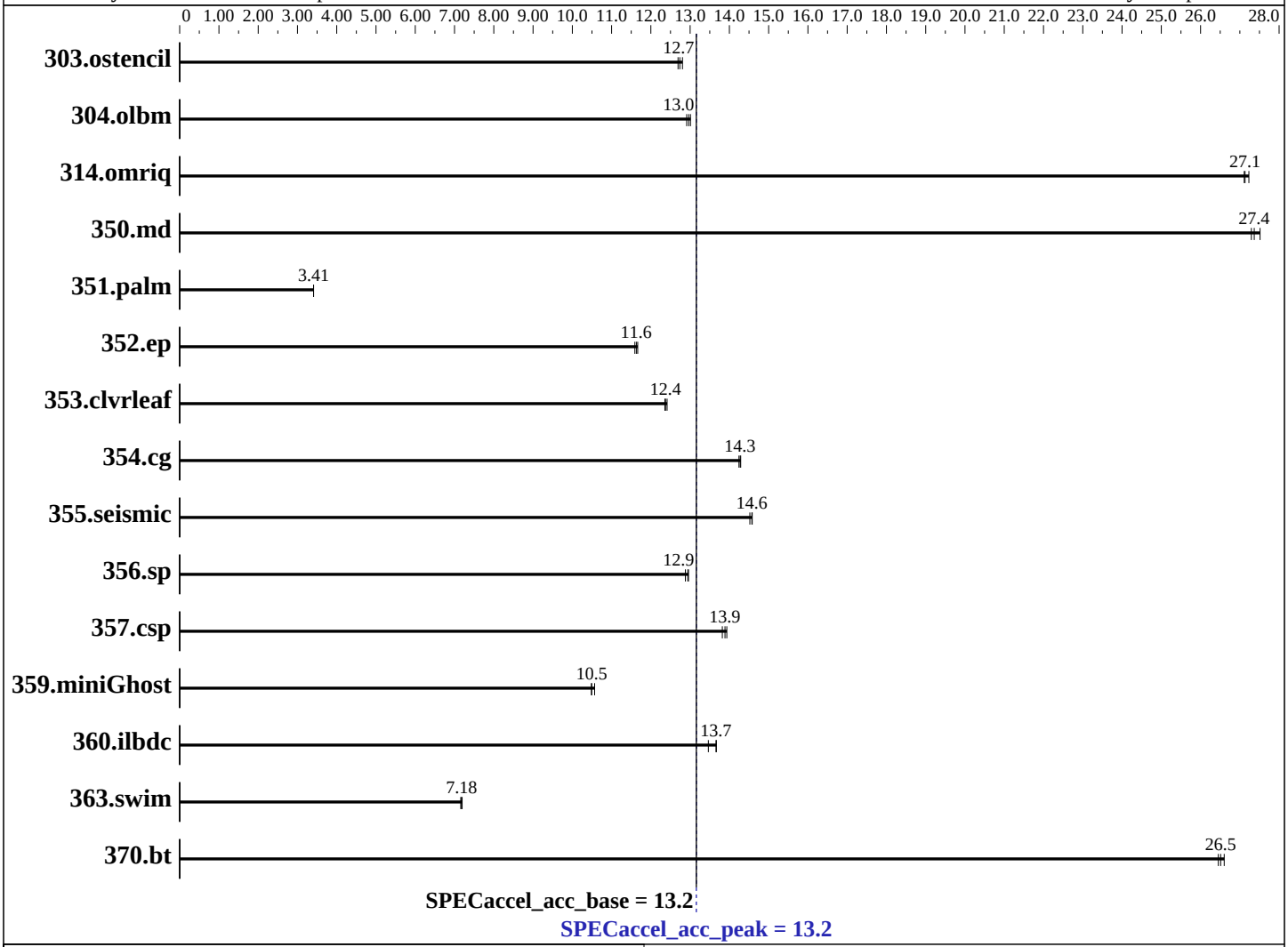
Tesla V100-SXM2-16GB
Power System AC922

SPECaccel_acc_peak = 13.2

SPECaccel_acc_base = 13.2

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

Test date: May-2019
Hardware Availability: Aug-2018
Software Availability: Apr-2019



Hardware

CPU Name:	POWER9 2.2 (pvr 004e 1202), altivec supported
CPU Characteristics:	
CPU MHz:	2300
CPU MHz Maximum:	3800
FPU:	Integrated
CPU(s) enabled:	20 cores, 2 chips, 20 cores/chip, 4 threads/core
CPU(s) orderable:	1,2 chips
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	120 MB I+D on chip per chip
Other Cache:	None

Continued on next page

Accelerator

Accel Model Name:	TESLA V100
Accel Vendor:	NVIDIA Corporation
Accel Name:	Tesla V100-SXM2-16GB
Type of Accel:	GPU
Accel Connection:	N/A
Does Accel Use ECC:	Yes
Accel Description:	See notes
Accel Driver:	NVIDIA UNIX ppc64le Kernel Module 418.67

SPEC ACCEL ACC Result

IBM
(Test Sponsor: NVIDIA Corporation)
Tesla V100-SXM2-16GB
Power System AC922

SPECaccel_acc_peak = 13.2

SPECaccel_acc_base = 13.2

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

Test date: May-2019
Hardware Availability: Aug-2018
Software Availability: Apr-2019

Hardware (Continued)

Memory: 128 GB (16 x 8 GB PC4-21300)
Disk Subsystem: 1 TB Seagate SATA HDD
Other Hardware: None

Software

Operating System: Red Hat Enterprise Linux Server release 7.5
Red Hat Enterprise Linux Server release 7.5 (Maipo)
4.14.0-49.8.1.el7a.ibmnvidia.6.1.ppc64le
Compiler: PGI Community Edition, Release 19.4
File System: xfs
System State: Run level 3 (add definition here)
Other Software: None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
303.ostencil	**11.4**	**12.7**	11.3	12.8	11.4	12.7	**11.4**	**12.7**	11.3	12.8	11.4	12.7
304.olbm	35.2	12.9	**35.1**	**13.0**	35.0	13.0	35.2	12.9	**35.1**	**13.0**	35.0	13.0
314.omriq	35.3	27.1	**35.2**	**27.1**	35.1	27.2	35.3	27.1	**35.2**	**27.1**	35.1	27.2
350.md	9.23	27.3	**9.21**	**27.4**	9.16	27.5	9.23	27.3	**9.21**	**27.4**	9.16	27.5
351.palm	**109**	**3.41**	108	3.41	109	3.41	**109**	**3.41**	108	3.41	109	3.41
352.ep	45.7	11.6	45.4	11.7	**45.6**	**11.6**	45.7	11.6	45.4	11.7	**45.6**	**11.6**
353.clvrleaf	35.8	12.4	36.0	12.4	**36.0**	**12.4**	35.8	12.4	36.0	12.4	**36.0**	**12.4**
354.cg	**28.6**	**14.3**	28.6	14.2	28.6	14.3	**28.6**	**14.3**	28.6	14.2	28.6	14.3
355.seismic	25.4	14.6	**25.4**	**14.6**	25.5	14.5	25.4	14.6	**25.4**	**14.6**	25.5	14.5
356.sp	**21.3**	**12.9**	21.4	12.9	21.3	13.0	**21.3**	**12.9**	21.4	12.9	21.3	13.0
357.csp	19.5	13.8	19.4	13.9	**19.4**	**13.9**	19.5	13.8	19.4	13.9	**19.4**	**13.9**
359.miniGhost	34.9	10.6	**35.2**	**10.5**	35.2	10.5	34.9	10.6	**35.2**	**10.5**	35.2	10.5
360.ilbdc	26.8	13.7	27.3	13.5	**26.9**	**13.7**	26.8	13.7	27.3	13.5	**26.9**	**13.7**
363.swim	32.1	7.16	**32.0**	**7.18**	32.0	7.19	32.1	7.16	**32.0**	**7.18**	32.0	7.19
370.bt	**8.41**	**26.5**	8.43	26.5	8.38	26.6	**8.41**	**26.5**	8.43	26.5	8.38	26.6

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.
```

Platform Notes

```
Sysinfo program /local/home/toepfer/SPECACCEL/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #$ c05a7f14b1b1765e3fe1df68447e8a35
running on perf-wsn1 Fri May 31 10:23:56 2019

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 : 3616.000000MHz
   machine : PowerNV 8335-GTC........
   model : 8335-GTC........
   platform : PowerNV
   revision : 2.2 (pvr 004e 1202)
   cpu : POWER9, 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.
*
      160 "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:       150251584 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 7.5 (Maipo)

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.5 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VARIANT="Server"
      VARIANT_ID="server"
      VERSION_ID="7.5"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.5 (Maipo)"
   redhat-release: Red Hat Enterprise Linux Server release 7.5 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.5 (Maipo)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:7.5:ga:server

uname -a:
   Linux perf-wsn1 4.14.0-49.8.1.el7a.ibmnvidia.6.1.ppc64le #1 SMP Tue Jun 5
```

Continued on next page

Platform Notes (Continued)

```
   13:56:12 -03 2018 ppc64le ppc64le ppc64le GNU/Linux

run-level 3 May 24 11:17

SPEC is set to: /local/home/toepfer/SPECACCEL
   Filesystem                Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel_wsn1-root xfs   927G  116G  812G  13% /

(End of data from sysinfo program)
Information from pgaccelinfo

CUDA Driver Version:           10010
NVRM version:                  NVIDIA UNIX ppc64le Kernel Module  418.67  Sat Apr  6 03:00:10 CDT 2019

Device Number:                 0
Device Name:                   Tesla V100-SXM2-16GB
Device Revision Number:        7.0
Global Memory Size:            16911433728
Number of Multiprocessors:     80
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:                    1530 MHz
Execution Timeout:             No
Integrated Device:             No
Can Map Host Memory:           Yes
Compute Mode:                  default
Concurrent Kernels:            Yes
ECC Enabled:                   Yes
Memory Clock Rate:             877 MHz
Memory Bus Width:              4096 bits
L2 Cache Size:                 6291456 bytes
Max Threads Per SMP:           2048
Async Engines:                 2
Unified Addressing:            Yes
Managed Memory:                Yes
Concurrent Managed Memory:     Yes
Preemption Supported:          Yes
Cooperative Launch:            Yes
  Multi-Device:                Yes
PGI Default Target:            -ta=tesla:cc70
```

Base Compiler Invocation

C benchmarks:
pgcc

Fortran benchmarks:
pgfortran

Benchmarks using both Fortran and C:
pgcc pgfortran

Base Optimization Flags

C benchmarks:
-fast -Mnouniform -Mfprelaxed -acc -ta=tesla:cc70

Fortran benchmarks:
-fast -Mnouniform -Mfprelaxed -acc -ta=tesla:cc70

Benchmarks using both Fortran and C:

353.clvrleaf: -fast -Mnouniform -Mfprelaxed -acc -ta=tesla:cc70

359.miniGhost: -fast -Mnouniform -Mfprelaxed -acc -ta=tesla:cc70 -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

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`

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

Tested with SPEC ACCEL v1.2.
Report generated on Fri Jun 7 12:31:27 2019 by SPEC ACCEL PS/PDF formatter v2947.