

# SPEC ACCEL™ ACC Result

Copyright 2015-2019 Standard Performance Evaluation Corporation

Dell

(Test Sponsor: NVIDIA Corporation)

Tesla V100-PCIE-16GB

PowerEdge R7425

SPECaccel\_acc\_peak = 12.3

SPECaccel\_acc\_base = 12.3

ACCEL license: 019

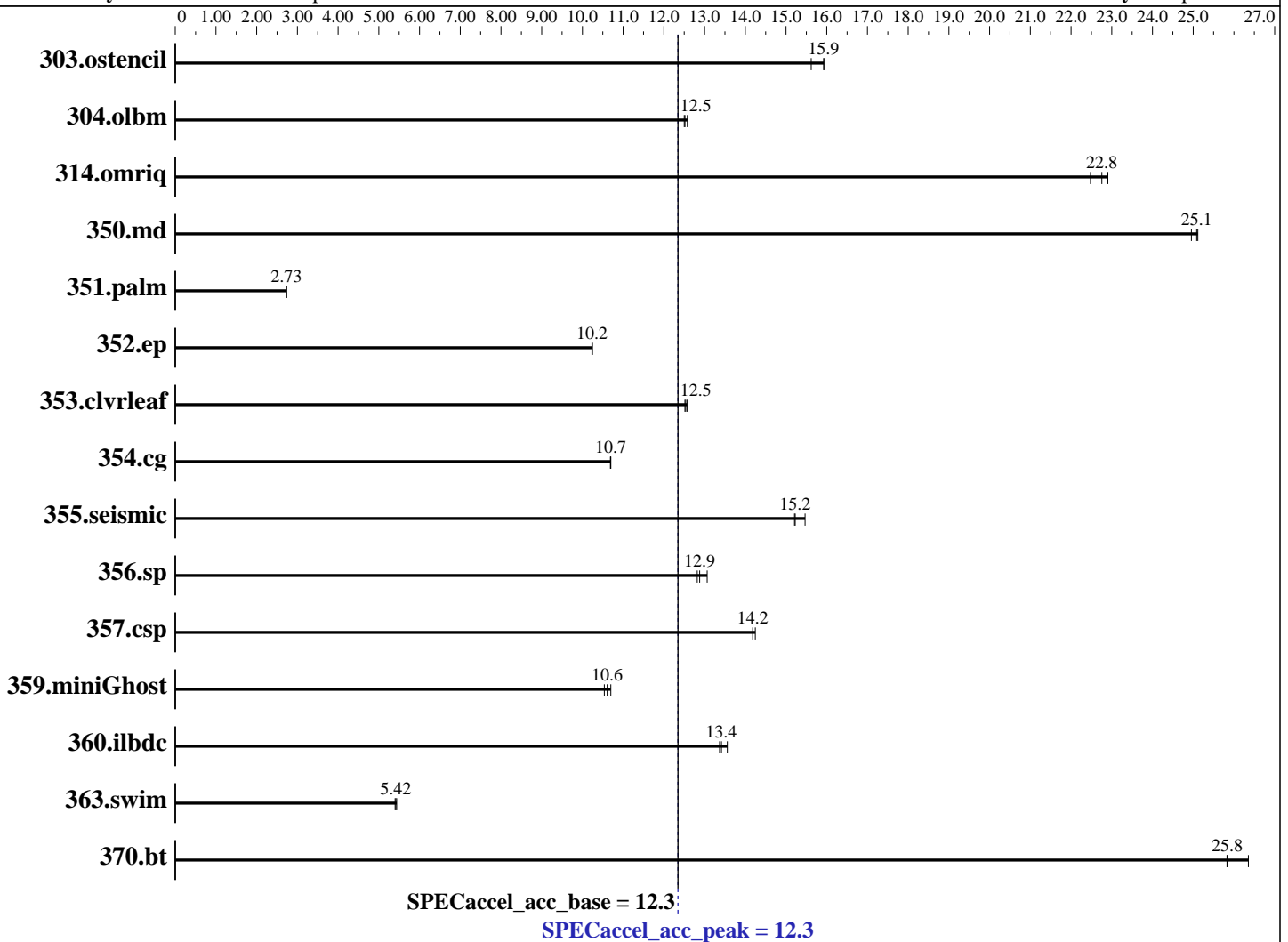
Test sponsor: NVIDIA Corporation

Tested by: NVIDIA Corporation

Test date: May-2019

Hardware Availability: Nov-2017

Software Availability: Apr-2019



## Hardware

CPU Name: AMD EPYC 7451 24-Core  
CPU Characteristics:  
CPU MHz: 2900  
CPU MHz Maximum: 3200  
FPU: Integrated  
CPU(s) enabled: 48 cores, 2 chips, 24 cores/chip, 2 threads/core  
CPU(s) orderable: 1,2 chips  
Primary Cache: 64 KB I + 32 KB D on chip per core  
Secondary Cache: 512 KB I+D on chip per core  
L3 Cache: 64 MB I+D on chip per chip  
Other Cache: None

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## Accelerator

Accel Model Name: Tesla V100  
Accel Vendor: NVIDIA Corporation  
Accel Name: Tesla V100-PCIE-16GB  
Type of Accel: GPU  
Accel Connection: PCIe  
Does Accel Use ECC: Yes  
Accel Description: See notes  
Accel Driver: NVIDIA UNIX x86\_64 Kernel Module 410.66

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## Hardware (Continued)

Memory: 256 GB (16 x 16GB PC4-21300 2666MHz DDR4)  
Disk Subsystem: Samsung 1 x 960 GB SATA SSD  
Other Hardware: None

## Software

Operating System: CentOS Linux release 7.5.1804 (Core)  
4.19.0-1.el7.elrepo.x86\_64  
Compiler: PGI Community Edition, Release 19.4  
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	9.10	15.9	<b>9.10</b>	<b>15.9</b>	9.28	15.6	9.10	15.9	<b>9.10</b>	<b>15.9</b>	9.28	15.6
304.olbm	<b>36.3</b>	<b>12.5</b>	36.4	12.5	36.2	12.6	<b>36.3</b>	<b>12.5</b>	36.4	12.5	36.2	12.6
314.omriq	41.7	22.9	<b>42.0</b>	<b>22.8</b>	42.5	22.5	41.7	22.9	<b>42.0</b>	<b>22.8</b>	42.5	22.5
350.md	10.0	25.1	10.1	25.0	<b>10.0</b>	<b>25.1</b>	10.0	25.1	10.1	25.0	<b>10.0</b>	<b>25.1</b>
351.palm	<b>136</b>	<b>2.73</b>	135	2.73	136	2.73	<b>136</b>	<b>2.73</b>	135	2.73	136	2.73
352.ep	<b>51.8</b>	<b>10.2</b>	51.8	10.2	51.7	10.2	<b>51.8</b>	<b>10.2</b>	51.8	10.2	51.7	10.2
353.clvleaf	35.6	12.5	35.4	12.6	<b>35.5</b>	<b>12.5</b>	35.6	12.5	35.4	12.6	<b>35.5</b>	<b>12.5</b>
354.cg	38.2	10.7	38.1	10.7	<b>38.2</b>	<b>10.7</b>	38.2	10.7	38.1	10.7	<b>38.2</b>	<b>10.7</b>
355.seismic	23.9	15.5	<b>24.3</b>	<b>15.2</b>	24.3	15.2	23.9	15.5	<b>24.3</b>	<b>15.2</b>	24.3	15.2
356.sp	21.5	12.8	21.1	13.1	<b>21.4</b>	<b>12.9</b>	21.5	12.8	21.1	13.1	<b>21.4</b>	<b>12.9</b>
357.csp	<b>19.0</b>	<b>14.2</b>	19.0	14.2	19.0	14.2	<b>19.0</b>	<b>14.2</b>	19.0	14.2	19.0	14.2
359.miniGhost	34.5	10.7	35.0	10.5	<b>34.8</b>	<b>10.6</b>	34.5	10.7	35.0	10.5	<b>34.8</b>	<b>10.6</b>
360.ilbdc	<b>27.4</b>	<b>13.4</b>	27.1	13.6	27.5	13.4	<b>27.4</b>	<b>13.4</b>	27.1	13.6	27.5	13.4
363.swim	<b>42.5</b>	<b>5.42</b>	42.6	5.40	42.3	5.44	<b>42.5</b>	<b>5.42</b>	42.6	5.40	42.3	5.44
370.bt	8.46	26.4	<b>8.63</b>	<b>25.8</b>	8.63	25.8	8.46	26.4	<b>8.63</b>	<b>25.8</b>	8.63	25.8

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 /local/home/toepfer/SPECACCEL/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #$ c05a7f14b1b1765e3feldf68447e8a35
running on perf-epyc4 Wed May 29 09:32:57 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

```
model name : AMD EPYC 7451 24-Core Processor
 2 "physical id"s (chips)
 96 "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 : 24
  siblings  : 48
  physical 0: cores 0 1 8 9 10 12 13 14 16 17 18 20 21 22 24 25 26 28 29 30
  physical 1: cores 0 1 8 9 10 12 13 14 16 17 18 20 21 22 24 25 26 28 29 30
cache size : 512 KB
```

From /proc/meminfo

```
MemTotal:      263857152 kB
HugePages_Total:       20
Hugepagesize:    2048 kB
```

/usr/bin/lsb\_release -d

```
CentOS Linux release 7.5.1804 (Core)
```

From /etc/\*release\* /etc/\*version\*

```
centos-release: CentOS Linux release 7.5.1804 (Core)
centos-release-upstream: Derived from Red Hat Enterprise Linux 7.5 (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 7.5.1804 (Core)
system-release: CentOS Linux release 7.5.1804 (Core)
system-release-cpe: cpe:/o:centos:centos:7
```

uname -a:

```
Linux perf-epyc4 4.19.0-1.el7.elrepo.x86_64 #1 SMP Mon Oct 22 10:40:32 EDT
2018 x86_64 x86_64 x86_64 GNU/Linux
```

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## Platform Notes (Continued)

run-level 3 Nov 20 11:12

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

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/mapper/centos_epyc4-root	xfs	890G	49G	841G	6%	/

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

(End of data from sysinfo program)

Information from pgaccelinfo

CUDA Driver Version: 10000

NVRM version: NVIDIA UNIX x86\_64 Kernel Module 410.66 Wed Oct 10 12:01:53 CDT 2018

Device Number: 0  
Device Name: Tesla V100-PCIE-16GB  
Device Revision Number: 7.0  
Global Memory Size: 16914055168  
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: 1380 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: 7  
Unified Addressing: Yes  
Managed Memory: Yes  
Concurrent Managed Memory: Yes

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## Platform Notes (Continued)

Preemption Supported: Yes  
Cooperative Launch: Yes  
Multi-Device: Yes  
PGI Default Target: -ta=tesla:cc70

## General Notes

Environment variables set by runspec before the start of the run:  
HUGETLB\_PATH = "/mnt/hugetlb"

## Base Compiler Invocation

C benchmarks:  
pgcc

Fortran benchmarks:  
pgfortran

Benchmarks using both Fortran and C:  
pgcc pgfortran

## Base Optimization Flags

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

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

Benchmarks using both Fortran and C:  
353.clvleaf: -fast -Mnouniform -Mhugetlb -acc -ta=tesla:cc70  
359.miniGhost: -fast -Mnouniform -Mhugetlb -acc -ta=tesla:cc70 -Mnomain

## Peak Optimization Flags

C benchmarks:  
303.ostencil: basepeak = yes

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## Peak Optimization Flags (Continued)

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:

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

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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC ACCEL v1.2.  
Report generated on Fri Jun 7 15:28:23 2019 by SPEC ACCEL PS/PDF formatter v2947.