SPEC ACCEL™ ACC Result

Dell
(Test Sponsor: Indiana University)

Tesla V100-SMX2-16GB
PowerEdge C4140 Server

SPECaccel_acc_peak = Not Run

SPECaccel_acc_base = 13.3

ACCEL license: 3440A
Test sponsor: Indiana University
Tested by: Indiana University
Test date: Aug-2019
Hardware Availability: May-2019

Tested by: Indiana University
Software Availability: Apr-2019

303.ostencil
304.olbm
314.omriq
350.md
351.palm
352.ep
353.clvrleaf
354.cg
355.seismic
356.sp
357.csp
359.miniGhost
360.ilbdc
363.swim
370.bt

SPEC accel acc_base = 13.3

Hardware

CPU Name: Intel Xeon Gold 6130
CPU Characteristics: Intel Turbo Boost on, SMT off
CPU MHz: 2100
CPU MHz Maximum: 3700
CPU(s) enabled: 32 cores, 2 chips, 16 cores/chip
CPU(s) orderable: 1,2 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 1 MB I+D on chip per core
L3 Cache: 22 MB I+D on chip per chip
Other Cache: None

Accelerator

Accel Model Name: Tesla V100
Accel Vendor: NVIDIA Corporation
Accel Name: Tesla V100-SMX2-16GB
Type of Accel: GPU
Accel Connection: PCIe
Does Accel Use ECC: Yes
Accel Description: V100-SMX2-16GB with NVLink (Persistence Mode enabled)
Accel Driver: NVIDIA UNIX x86_64 Kernel Module 418.67
## Dell

(Test Sponsor: Indiana University)

### Tesla V100-SMX2-16GB PowerEdge C4140 Server

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### Hardware (Continued)

<table>
<thead>
<tr>
<th>Memory:</th>
<th>256 GB (16 x 16 GB 2Rx8 PC4-2666V-R)</th>
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<tbody>
<tr>
<td>Disk Subsystem:</td>
<td>None</td>
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<tr>
<td>Other Hardware:</td>
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### Software

<table>
<thead>
<tr>
<th>Operating System:</th>
<th>Red Hat Enterprise Linux Server release 7.6 (Maipo) 3.10.0-957.21.3.el7.x86_64</th>
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<tbody>
<tr>
<td>Compiler:</td>
<td>PGI Community Edition, Release 19.4</td>
</tr>
<tr>
<td>File System:</td>
<td>cephfs nfs4 (ganesha) over 100Gbits/s Ethernet</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
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<tr>
<td>Other Software:</td>
<td>CUDA 10.1</td>
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### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>360.ilbdc</td>
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</table>

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

## Platform Notes

Sysinfo program /home/lijunj/junjie_benchmarks/spec/accel-1.2-bm/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #$ c05a7f14b1b1765e3fe1df68447e8a35
running on r08g05 Wed Aug 7 02:05:24 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

Continued on next page
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Platform Notes (Continued)

From /proc/cpuinfo
  model name : Intel(R) Xeon(R) Gold 6130 CPU @ 2.10GHz
  2 "physical id"s (chips)
  32 "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 : 16
  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 : 22528 KB

From /proc/meminfo
  MemTotal: 196261708 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux Server"
    VERSION="7.6 (Maipo)"
    ID="rhel"
    IDLIKE="fedora"
    VARIANT="Server"
    VARIANT_ID="server"
    VERSION_ID="7.6"
    PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"
    redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)
    system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)

uname -a:
  Linux r08g05 3.10.0-957.21.3.el7.x86_64 #1 SMP Fri Jun 14 02:54:29 EDT 2019
  x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jul 15 10:51

SPEC is set to: /home/lijunj/junjie_benchmarks/spec/accel-1.2-bm

Filesystem Size Used Avail Use% Mounted on
172.16.129.177:/volumes/_nogroup/24ec4401-f96d-40a5-99a5-e96f73257d2f nfs4 128G 102G 27G 79% /mnt

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
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**Platform Notes (Continued)**

- Information from pgaccelinfo:
  - CUDA Driver Version: 10010
  - NVRM version: NVIDIA UNIX x86_64 Kernel Module 418.67
  - Device Number: 0
  - Device Name: Tesla V100-SXM2-16GB
  - Device Revision Number: 7.0
  - Global Memory Size: 1691405168
  - 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: No
  - Memory Clock Rate: 877 MHz
  - Memory Bus Width: 4096 bits
  - L2 Cache Size: 6291456 bytes
  - Max Threads Per SMP: 2048
  - Async Engines: 5
  - 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

**General Notes**

Four V100-SMX2-16GB GPUs were installed on the system, three of them were idle while only one is active for running SPEC Accel.

CPUs and GPUs are connected via PCIe, while the four GPUs are connected through NVLink. The NVLink connection is not used in this test.
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General Notes (Continued)

Stacksize set to 'unlimited':
   ulimit -s unlimited

Spectre & Meltdown:
   Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
   Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
   Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

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:cc70 -ta=tesla:cuda10.1

Fortran benchmarks:
   -fast -Mfprelaxed -acc -ta=tesla:cc70 -ta=tesla:cuda10.1

Benchmarks using both Fortran and C:
   353.clvrleaf: -fast -Mfprelaxed -acc -ta=tesla:cc70 -ta=tesla:cuda10.1
   359.miniGhost: -fast -Mfprelaxed -acc -ta=tesla:cc70 -ta=tesla:cuda10.1
   -Mnomain

The flags file that was used to format this result can be browsed at
https://www.spec.org/accel/flags/pgi2019_flags.html

You can also download the XML flags source by saving the following link:
https://www.spec.org/accel/flags/pgi2019_flags.xml
<table>
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For questions about this result, please contact the tester. For other inquiries, please contact webmaster@spec.org.