Dell (Test Sponsor: Indiana University)

Tesla V100X-16Q

PowerEdge C4140 Server (KVM virtual machine)

SPECCaccel_acc_peak = Not Run

SPECCaccel_acc_base = 13.3

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

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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

Hardware
CPU Name: Intel Xeon Gold 6130
CPU Characteristics: Intel Turbo Boost on, SMT off. 8 of 32 cores allocated to KVM virtual machine.
CPU MHz: 2100
CPU MHz Maximum: 3700
FPU: Integrated
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

Accelerator
Accel Model Name: Tesla V100
Accel Vendor: NVIDIA Corporation
Accel Name: Tesla V100X-16Q
Type of Accel: GPU
Accel Connection: PCIe
Does Accel Use ECC: Yes
Accel Description: a full virtualized V100-SMX2-16GB with NVLink (Persistence Mode enabled) allocated to KVM virtual machine.
Accel Driver: NVIDIA UNIX x86_64 Kernel Module 418.70

Continued on next page

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/
### SPEC ACCEL ACC Result

**Dell**

(Test Sponsor: Indiana University)

**Tesla V100X-16Q**

PowerEdge C4140 Server (KVM virtual machine)

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<thead>
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</tr>
<tr>
<td><strong>Tested by</strong></td>
<td>Indiana University</td>
</tr>
</tbody>
</table>

#### Hardware (Continued)

- Other Cache: None
- Memory: 256 GB (16 x 16 GB 2Rx8 PC4-2666V-R) 45 GB (45/256 GB Allocated for KVM)
- Disk Subsystem: None
- Other Hardware: None

#### Software

- Operating System:
  - VM: CentOS Linux release 7.6.1810 (Core) 3.10.0-957.12.1.el7.x86_64
  - Host: Red Hat Enterprise Linux Server release 7.6 (Maipo) 3.10.0-957.21.3.el7.x86_64
- Compiler: PGI Community Edition, Release 19.4
- File System: cephfs nfsv4 (ganesha) over 100Gbits/s Ethernet
- System State: Run level 3 (multi-user)
- Other Software: KVM Version 2.12, CUDA 10.1

#### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base Seconds</th>
<th>Ratio</th>
<th>Peak Seconds</th>
<th>Ratio</th>
<th>Base Seconds</th>
<th>Ratio</th>
<th>Peak Seconds</th>
<th>Ratio</th>
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</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.
Dell
(Test Sponsor: Indiana University)

Tesla V100X-16Q
PowerEdge C4140 Server (KVM virtual machine)

<table>
<thead>
<tr>
<th>SPECaccel_acc_peak</th>
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ACCEL license: 3440A
Test sponsor: Indiana University
Tested by: Indiana University

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

Platform Notes

$Rev: 6965 $ $Date:: 2015-04-21 # c05a7f14b1b1765e3fe1df68447e8a35
running on v100x-16q.novalocal Thu May 30 17:09:13 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 : Intel(R) Xeon(R) Gold 6130 CPU @ 2.10GHz
- 8 "physical id"s (chips)
- 8 "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 : 1
  - siblings : 1
  - physical 0: cores 0
  - physical 1: cores 0
  - physical 2: cores 0
  - physical 3: cores 0
  - physical 4: cores 0
  - physical 5: cores 0
  - physical 6: cores 0
  - physical 7: cores 0
- cache size : 16384 KB

From /proc/meminfo

- MemTotal: 47229476 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

- centos-release: CentOS Linux release 7.6.1810 (Core)
- centos-release-upstream: Derived from Red Hat Enterprise Linux 7.6 (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 7.6.1810 (Core)
- system-release: CentOS Linux release 7.6.1810 (Core)
- system-release-cpe: cpe:/o:centos:centos:7

uname -a:
Linux v100x-16q.novalocal 3.10.0-957.12.1.el7.x86_64 #1 SMP Mon Apr 29
Dell (Test Sponsor: Indiana University)  

**Tesla V100X-16Q**  
PowerEdge C4140 Server (KVM virtual machine)  

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**ACCEL license:** 3440A  
**Test sponsor:** Indiana University  
**Tested by:** Indiana University  
**Test date:** May-2019  
**Hardware Availability:** May-2019  
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### Platform Notes (Continued)

14:59:59 UTC 2019 x86_64 x86_64 x86_64 GNU/Linux  
run-level 3 May 3 18:31

SPEC is set to: /home/lijunj/junjie_benchmarks/spec/accel-1.2-16q  

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Information from pgaccelinfo:

- **CUDA Driver Version:** 10010
- **NVRM version:** NVIDIA UNIX x86_64 Kernel Module 418.70
- **Device Number:** 0
- **Device Name:** GRID V100X-16Q
- **Device Revision Number:** 7.0
- **Global Memory Size:** 17179869184
- **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
- **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:** 2
- **Unified Addressing:** Yes
- **Managed Memory:** No
- **Preemption Supported:** Yes
- **Cooperative Launch:** Yes
- **Multi-Device:** Yes
- **PGI Default Target:** -ta=tesla:cc70
SPEC ACCEL ACC Result

Dell
(Test Sponsor: Indiana University)

Tesla V100X-16Q
PowerEdge C4140 Server (KVM virtual machine)

SPECaccel_acc_peak = Not Run
SPECaccel_acc_base = 13.3

General Notes

Four V100-SMX2-16GB GPUs were installed on the host 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.

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
SPEC ACCEL ACC Result

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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

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

Tested with SPEC ACCEL v1.2.
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