SPEC ACCEL™ OCL Result

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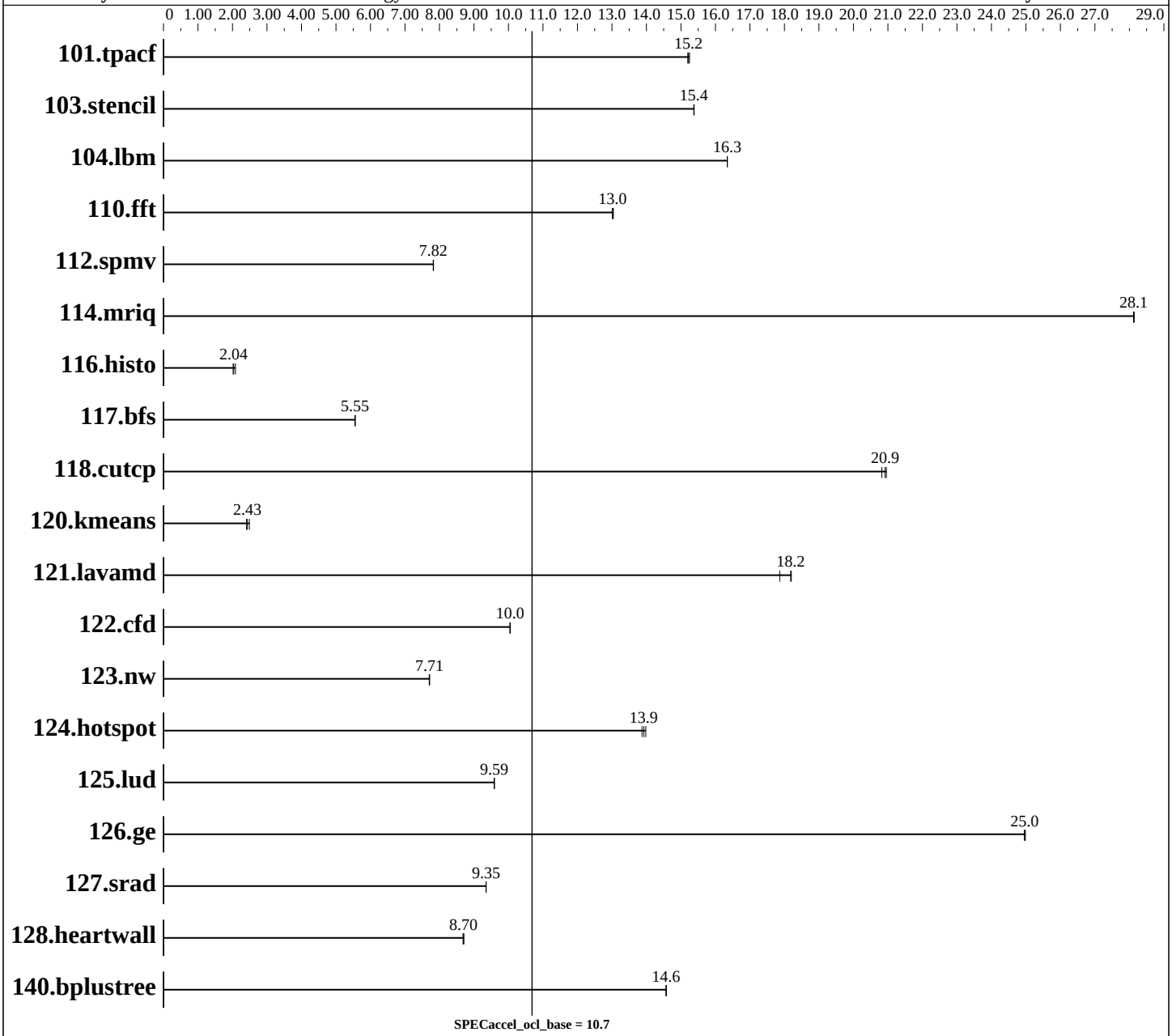
Lenovo Global Technology
Tesla V100-PCIE-16GB
ThinkSystem SR670

SPECaccel_ocl_peak = Not Run

SPECaccel_ocl_base = 10.7

ACCEL license: 28
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test date: Feb-2019
Hardware Availability: Feb-2019
Software Availability: Feb-2019



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Hardware

CPU Name:	Intel Xeon Gold 6142
CPU Characteristics:	
CPU MHz:	2600
CPU MHz Maximum:	3700
FPU:	Integrated
CPU(s) enabled:	32 cores, 2 chips, 16 cores/chip
CPU(s) orderable:	2 chip
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
Memory:	768 GB (24 x 32 GB 2Rx4 PC4-2666V)
Disk Subsystem:	Micron 480 GB 6 Gbps SATA 2.5" SSD (4XB7A10153)
Other Hardware:	None

Accelerator

Accel Model Name:	Tesla V100
Accel Vendor:	NVIDIA
Accel Name:	Tesla V100-PCIE-16GB
Type of Accel:	GPU
Accel Connection:	PCIe 3.0 16x
Does Accel Use ECC:	Yes
Accel Description:	Tesla V100-PCIE-16GB
Accel Driver:	NVIDIA UNIX x86_64 Kernel Module 396.26

Software

Operating System:	Red Hat Enterprise Linux Server release 7.5 (Maipo) 3.10.0-862.el7.x86_64
Compiler:	PGI Accelerator Server Complete, Release 18.7
File System:	xfs
System State:	Run level 3 (Multi-User)
Other Software:	CUDA 9.2 SDK

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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
101.tpacf	7.02	15.2	7.04	15.2	**7.03**	**15.2**						
103.stencil	**8.13**	**15.4**	8.13	15.4	8.13	15.4						
104.lbm	**6.85**	**16.3**	6.85	16.3	6.85	16.3						
110.fft	8.53	13.0	**8.52**	**13.0**	8.51	13.0						
112.spmv	**18.8**	**7.82**	18.8	7.82	18.8	7.83						
114.mriq	3.87	28.1	3.88	28.1	**3.88**	**28.1**						
116.histo	**56.0**	**2.04**	54.7	2.09	56.5	2.02						
117.bfs	21.0	5.56	21.1	5.55	**21.1**	**5.55**						
118.cutcp	4.72	21.0	**4.73**	**20.9**	4.75	20.8						
120.kmeans	41.5	2.41	**41.1**	**2.43**	40.2	2.49						
121.lavamd	**6.00**	**18.2**	5.99	18.2	6.10	17.9						
122.cfd	12.5	10.0	12.5	10.0	**12.5**	**10.0**						
123.nw	14.9	7.71	**14.9**	**7.71**	14.9	7.70						
124.hotspot	**8.19**	**13.9**	8.22	13.9	8.15	14.0						
125.lud	12.4	9.59	12.4	9.58	**12.4**	**9.59**						
126.ge	6.21	25.0	**6.21**	**25.0**	6.20	25.0						
127.srad	**12.2**	**9.35**	12.2	9.35	12.2	9.35						
128.heartwall	12.2	8.68	12.2	8.71	**12.2**	**8.70**						
140.bplustree	7.41	14.6	**7.41**	**14.6**	7.41	14.6						

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

Platform Notes

```
Sysinfo program /home/ACCEL1.2/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #$ c05a7f14b1b1765e3fe1df68447e8a35
running on bannerrh75 Fri Feb 22 07:14:24 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

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) Gold 6142 CPU @ 2.60GHz
      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.)
```

Continued on next page

Platform Notes (Continued)

```
      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:       792040060 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 bannerrh75 3.10.0-862.el7.x86_64 #1 SMP Wed Mar 21 18:14:51 EDT 2018
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Feb 22 05:06

SPEC is set to: /home/ACCEL1.2
   Filesystem            Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   192G   71G  121G  37% /home
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.

  BIOS Lenovo -[G1E105G-1.10]- 12/07/2018
  Memory:
   24x Micron 36ASF4G72PZ-2G6D1 32 GB 2 rank 2666 MHz

(End of data from sysinfo program)
```

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General Notes

```
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.
Run nvidia-smi -pm 1 to enable persistence mode.
-DSPEC_LOCAL_MEMORY_HEADROOM works as a portability flag for 116.histo,
but misplaced under optimization flag. The flag does not affect performance of the benchmark.
```

Base Runtime Environment

C benchmarks:

```
OpenCL Platform: NVIDIA CUDA, OpenCL 1.2 CUDA 9.2.106
OpenCL Device #0: Tesla V100-PCIE-16GB, v 396.26
```

C++ benchmarks:

```
OpenCL Platform: NVIDIA CUDA, OpenCL 1.2 CUDA 9.2.106
OpenCL Device #0: Tesla V100-PCIE-16GB, v 396.26
```

Base Compiler Invocation

C benchmarks:

```
pgcc
```

C++ benchmarks:

```
pgc++
```

Base Portability Flags

116.histo: `-DSPEC_LOCAL_MEMORY_HEADROOM=2`(*)
118.cutcp: `-D__GNUC__`

(*) Indicates a portability flag that was found in a non-portability variable.

Base Optimization Flags

C benchmarks:

110.fft: `-fast -Mfprelaxed -DSPEC_LOCAL_MEMORY_HEADROOM=2`

Continued on next page

Base Optimization Flags (Continued)

114.mriq: Same as 110.fft

116.histo: -fast -Mfprelaxed

117.bfs: Same as 110.fft

118.cutcp: Same as 110.fft

121.lavamd: Same as 110.fft

124.hotspot: Same as 110.fft

127.srad: Same as 110.fft

128.heartwall: Same as 110.fft

140.bplustree: Same as 110.fft

C++ benchmarks:
-fast -Mfprelaxed -DSPEC_LOCAL_MEMORY_HEADROOM=2

Base Other Flags

C benchmarks:
-I/usr/local/cuda-9.2/targets/x86_64-linux/include/
-L/usr/local/cuda-9.2/targets/x86_64-linux/lib -lOpenCL

C++ benchmarks:
-I/usr/local/cuda-9.2/targets/x86_64-linux/include/
-L/usr/local/cuda-9.2/targets/x86_64-linux/lib -lOpenCL

The flags files that were used to format this result can be browsed at
https://www.spec.org/accel/flags/Lenovo-SPECACCEL1.2_Platform_Flags.html
https://www.spec.org/accel/flags/pgi2014_flags.20190321.html

You can also download the XML flags sources by saving the following links:
https://www.spec.org/accel/flags/Lenovo-SPECACCEL1.2_Platform_Flags.xml
https://www.spec.org/accel/flags/pgi2014_flags.20190321.xml

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

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