SPEC ACCEL™ OCL Result

Lenovo Global Technology

NVIDIA Tesla V100S-PCIE-16GB

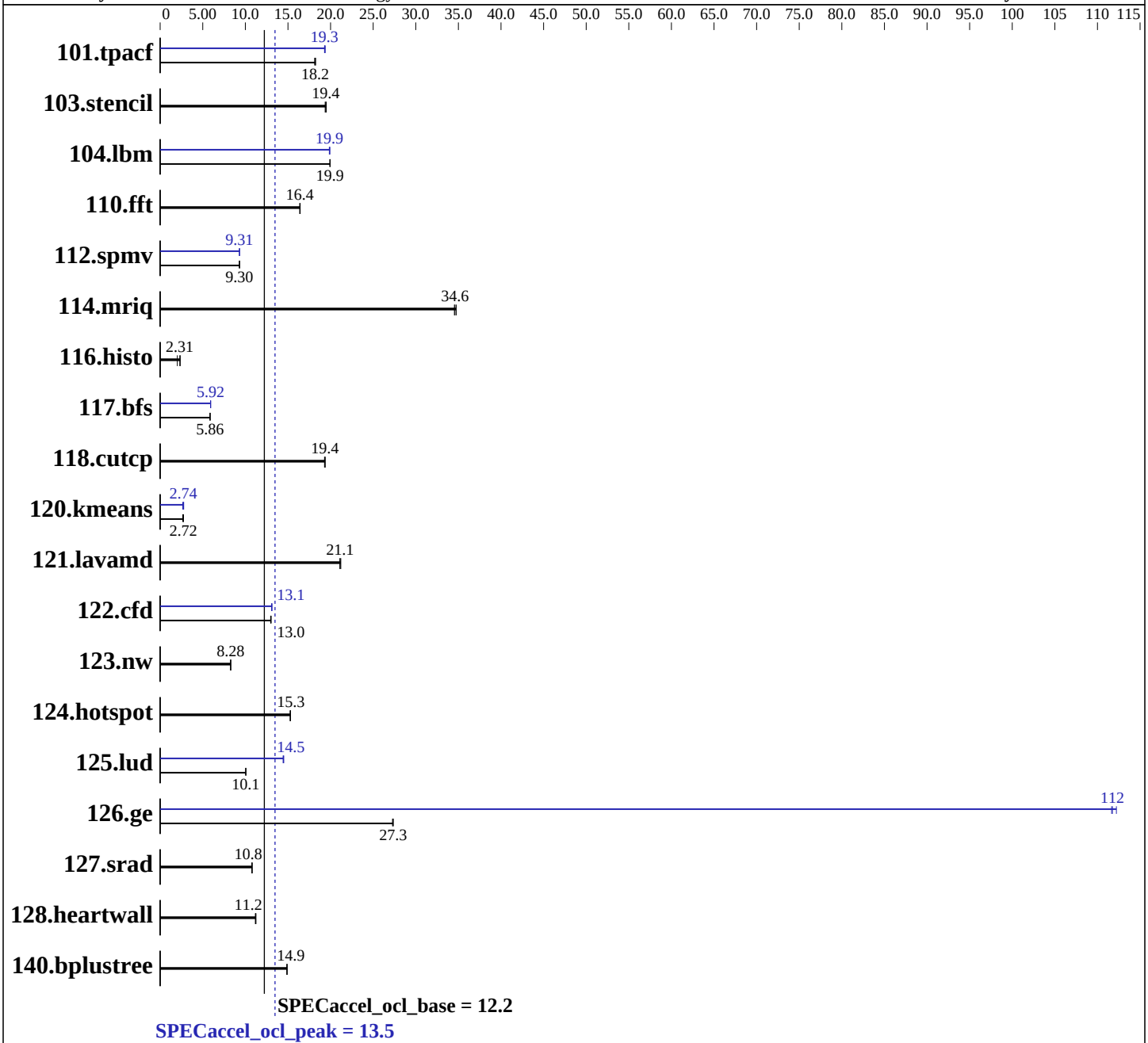
ThinkSystem SR860 V2

SPECaccel_ocl_peak = 13.5

SPECaccel_ocl_base = 12.2

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

Test date: Aug-2020
Hardware Availability: Oct-2020
Software Availability: Oct-2020



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Hardware

CPU Name:	Intel Xeon Platinum 8380H
CPU Characteristics:	Intel Turbo Boost Technology up to 4.3 GHz
CPU MHz:	2900
CPU MHz Maximum:	4300
FPU:	Integrated
CPU(s) enabled:	112 cores, 4 chips, 28 cores/chip
CPU(s) orderable:	2,4 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:	39424 KB I+D on chip per chip
Other Cache:	None
Memory:	1536 GB (48 x 32 GB 2Rx8 PC4-3200AA-R)
Disk Subsystem:	1 x 1TB SATA 2.5" SSD
Other Hardware:	None

Accelerator

Accel Model Name:	Tesla V100S
Accel Vendor:	NVIDIA Corporation
Accel Name:	NVIDIA Tesla V100S-PCIE-16GB
Type of Accel:	GPU
Accel Connection:	PCIe 3.0 16x
Does Accel Use ECC:	Yes
Accel Description:	NVIDIA Tesla V100S-PCIE-16GB
Accel Driver:	NVIDIA UNIX x86_64 Kernel Module 450.51.06

Software

Operating System:	SUSE Linux Enterprise Server 15 SP2 5.3.18-22-default
Compiler:	Nvidia HPC SDK Release 20.5
File System:	xfs
System State:	Run level 3
Other Software:	CUDA 11.0 SDK

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
101.tpacf	**5.88**	**18.2**	5.90	18.1	5.87	18.2	5.55	19.3	**5.54**	**19.3**	5.52	19.4
103.stencil	**6.43**	**19.4**	6.46	19.4	6.41	19.5	**6.43**	**19.4**	6.46	19.4	6.41	19.5
104.lbm	5.61	20.0	5.62	19.9	**5.62**	**19.9**	5.62	19.9	5.64	19.9	**5.63**	**19.9**
110.fft	**6.77**	**16.4**	6.77	16.4	6.75	16.4	**6.77**	**16.4**	6.77	16.4	6.75	16.4
112.spmv	15.7	9.34	15.8	9.30	**15.8**	**9.30**	15.8	9.31	**15.8**	**9.31**	15.8	9.32
114.mriq	3.14	34.7	**3.15**	**34.6**	3.16	34.5	3.14	34.7	**3.15**	**34.6**	3.16	34.5
116.histo	**49.4**	**2.31**	48.3	2.36	56.6	2.02	**49.4**	**2.31**	48.3	2.36	56.6	2.02
117.bfs	**20.0**	**5.86**	20.0	5.86	19.9	5.87	19.7	5.93	19.8	5.91	**19.8**	**5.92**
118.cutcp	**5.11**	**19.4**	5.13	19.3	5.11	19.4	**5.11**	**19.4**	5.13	19.3	5.11	19.4
120.kmeans	36.4	2.74	37.7	2.65	**36.8**	**2.72**	36.2	2.76	37.7	2.65	**36.4**	**2.74**
121.lavamd	5.17	21.1	**5.16**	**21.1**	5.14	21.2	5.17	21.1	**5.16**	**21.1**	5.14	21.2
122.cfd	9.72	13.0	**9.69**	**13.0**	9.68	13.0	9.63	13.1	9.60	13.1	**9.62**	**13.1**
123.nw	**13.9**	**8.28**	13.9	8.29	13.9	8.27	**13.9**	**8.28**	13.9	8.29	13.9	8.27
124.hotspot	7.45	15.3	7.48	15.2	**7.45**	**15.3**	7.45	15.3	7.48	15.2	**7.45**	**15.3**
125.lud	11.8	10.1	11.8	10.0	**11.8**	**10.1**	**8.22**	**14.5**	8.25	14.4	8.20	14.5
126.ge	5.67	27.3	5.68	27.3	**5.67**	**27.3**	1.38	112	1.39	112	**1.39**	**112**
127.srad	10.6	10.8	**10.6**	**10.8**	10.6	10.8	10.6	10.8	**10.6**	**10.8**	10.6	10.8
128.heartwall	9.49	11.2	**9.46**	**11.2**	9.42	11.2	9.49	11.2	**9.46**	**11.2**	9.42	11.2
140.bplustree	7.26	14.9	**7.26**	**14.9**	7.25	14.9	7.26	14.9	**7.26**	**14.9**	7.25	14.9

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 /home/ACCEL1.3/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #$ c05a7f14b1b1765e3fe1df68447e8a35
running on Narvi152 Tue Aug 18 13:36:52 2020

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) Platinum 8380H CPU @ 2.90GHz
```

Continued on next page

Platform Notes (Continued)

```
      4 "physical id"s (chips)
      112 "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 : 28
      siblings  : 28
      physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
      physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
      physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
      physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
      25 26 27 28 29 30
   cache size : 39424 KB

From /proc/meminfo
   MemTotal:       1584974840 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="SLES"
      VERSION="15-SP2"
      VERSION_ID="15.2"
      PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
      ID="sles"
      ID_LIKE="suse"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15:sp2"

uname -a:
   Linux Narvi152 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeba)
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Aug 17 15:54

SPEC is set to: /home/ACCEL1.3
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda4      xfs   490G   47G  443G  10% /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.
```

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Platform Notes (Continued)

```
    BIOS Lenovo M5E103N-1.00 08/07/2020
    Memory:
     48x Samsung M393A4G43AB3-CWE 32 GB 2 rank 3200 MT/s

  (End of data from sysinfo program)
```

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.
```

Base Runtime Environment

C benchmarks:

```
OpenCL Platform: NVIDIA CUDA, OpenCL 1.2 CUDA 11.0.197
OpenCL Device #0: Tesla V100S-PCIE-32GB, v 450.51.06
```

C++ benchmarks:

```
OpenCL Platform: NVIDIA CUDA, OpenCL 1.2 CUDA 11.0.197
OpenCL Device #0: Tesla V100S-PCIE-32GB, v 450.51.06
```

Base Compiler Invocation

C benchmarks:

```
nvc
```

C++ benchmarks:

```
nvc++
```

Base Portability Flags

116.histo: `-DSPEC_LOCAL_MEMORY_HEADROOM=1`

Base Optimization Flags

C benchmarks:
```
-fast -Mfprelaxed
```

C++ benchmarks:
```
-fast -Mfprelaxed
```

Base Other Flags

C benchmarks:
```
-I/usr/local/cuda-11.0/targets/x86_64-linux/include
-L/usr/local/cuda-11.0/lib64 -lOpenCL
```

C++ benchmarks:
```
-I/usr/local/cuda-11.0/targets/x86_64-linux/include
-L/usr/local/cuda-11.0/lib64 -lOpenCL
```

Peak Runtime Environment

C benchmarks:
```
OpenCL Platform: NVIDIA CUDA, OpenCL 1.2 CUDA 11.0.197
OpenCL Device #0: Tesla V100S-PCIE-32GB, v 450.51.06
```

C++ benchmarks:
```
OpenCL Platform: NVIDIA CUDA, OpenCL 1.2 CUDA 11.0.197
OpenCL Device #0: Tesla V100S-PCIE-32GB, v 450.51.06
```

Peak Compiler Invocation

C benchmarks:
```
nvc
```

C++ benchmarks:
```
nvc++
```

Peak Portability Flags

116.histo: `-DSPEC_LOCAL_MEMORY_HEADROOM=1`

Peak Optimization Flags

C benchmarks:

110.fft: `basepeak = yes`

114.mriq: `basepeak = yes`

116.histo: `basepeak = yes`

117.bfs: `-fast -Mfprelaxed -DSPEC_ACCEL_WG_SIZE_0_0=64 -DSPEC_ACCEL_WG_SIZE_1_0=64`

118.cutcp: `basepeak = yes`

121.lavamd: `basepeak = yes`

124.hotspot: `basepeak = yes`

127.srad: `basepeak = yes`

128.heartwall: `basepeak = yes`

140.bplustree: `basepeak = yes`

C++ benchmarks:

101.tpacf: `-fast -Mfprelaxed -DSPEC_ACCEL_WG_SIZE_0_0=1024`

103.stencil: `basepeak = yes`

104.lbm: `-fast -Mfprelaxed -DSPEC_ACCEL_WG_SIZE_0_0=32 -DSPEC_ACCEL_WG_SIZE_0_1=1 -DSPEC_ACCEL_WG_SIZE_0_2=1`

112.spmv: `-fast -Mfprelaxed -DSPEC_ACCEL_WG_SIZE_0_0=96`

120.kmeans: `-fast -Mfprelaxed -DSPEC_ACCEL_WG_SIZE_0_0=288`

122.cfd: `-fast -Mfprelaxed -DSPEC_ACCEL_WG_SIZE_3_0=288`

123.nw: `basepeak = yes`

125.lud: `-fast -Mfprelaxed -DSPEC_ACCEL_WG_SIZE_0_0=32`

126.ge: `-fast -Mfprelaxed -DSPEC_ACCEL_WG_SIZE_0_0=512 -DSPEC_ACCEL_WG_SIZE_1_0=1 -DSPEC_ACCEL_WG_SIZE_1_1=512`

Peak Other Flags

C benchmarks:

```
-I/usr/local/cuda-11.0/targets/x86_64-linux/include
-L/usr/local/cuda-11.0/lib64 -lOpenCL
```

C++ benchmarks:

```
-I/usr/local/cuda-11.0/targets/x86_64-linux/include
-L/usr/local/cuda-11.0/lib64 -lOpenCL
```

The flags file that was used to format this result can be browsed at
`https://www.spec.org/accel/flags/nv2020_flags.html`

You can also download the XML flags source by saving the following link:
`https://www.spec.org/accel/flags/nv2020_flags.xml`

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

Tested with SPEC ACCEL v1.3.
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