



# SPEC ACCEL™ OCL Result

Copyright 2015-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology  
NVIDIA Tesla A100-PCIE-40GB  
ThinkSystem SR655

SPECaccel\_ocl\_peak = 18.2

SPECaccel\_ocl\_base = 15.8

ACCEL license: 28

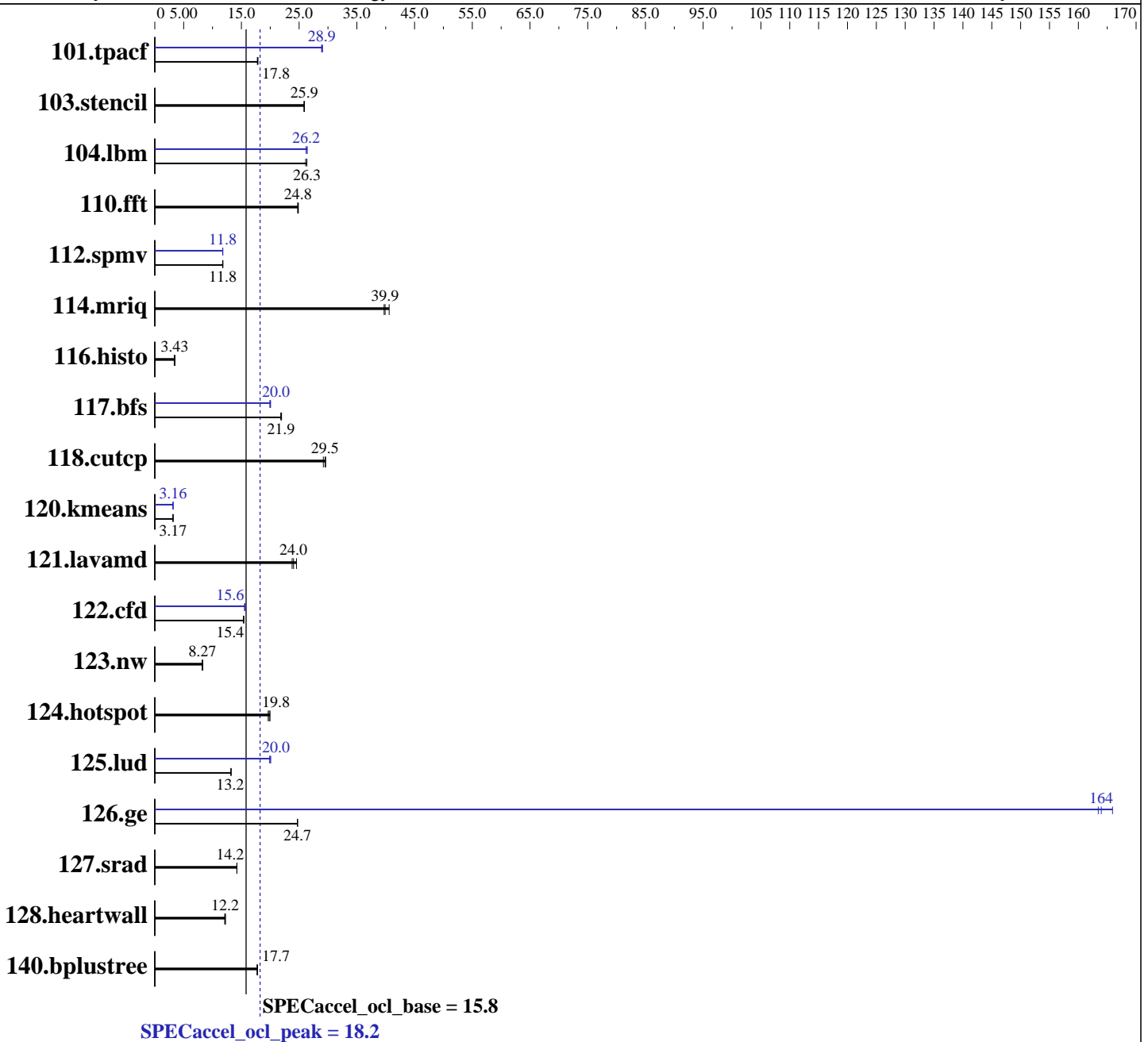
Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: May-2021

Hardware Availability: Jun-2021

Software Availability: Jun-2021





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## Hardware

CPU Name: AMD EPYC 7763  
CPU Characteristics: Turbo up to 3.5 GHz  
CPU MHz: 2450  
CPU MHz Maximum: 3500  
FPU: Integrated  
CPU(s) enabled: 64 cores, 1 chip, 64 cores/chip  
CPU(s) orderable: 1 chip  
Primary Cache: 32 KB I + 32 KB D on chip per core  
Secondary Cache: 512 KB I+D on chip per core  
L3 Cache: 256 MB I+D on chip per chip  
32 MB shared / 8 cores  
Other Cache: None  
Memory: 256 GB (8 x 32 GB 2Rx8 PC4-3200AA-R)  
Disk Subsystem: 1 x 480 GB 2.5" SSD  
Other Hardware: None

## Accelerator

Accel Model Name: NVIDIA Tesla A100-PCIE-40GB  
Accel Vendor: NVIDIA Corporation  
Accel Name: NVIDIA Tesla A100-PCIE-40GB  
Type of Accel: GPU  
Accel Connection: PCIe 4.0 16x  
Does Accel Use ECC: Yes  
Accel Description: NVIDIA Tesla A100-PCIE-40GB  
Accel Driver: NVIDIA UNIX x86\_64 Kernel Module 450.51.05

## Software

Operating System: Red Hat Enterprise Linux release 8.3 (Ootpa)  
4.18.0-240.el8.x86\_64  
Compiler: Nvidia HPC SDK Release 21.3  
File System: xfs  
System State: Run level 3  
Other Software: CUDA 11.0 SDK



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## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
101.tpacf	6.02	17.8	<u>6.00</u>	<u>17.8</u>	5.99	17.9	3.70	28.9	3.68	29.1	<u>3.70</u>	<u>28.9</u>
103.stencil	4.84	25.8	<u>4.82</u>	<u>25.9</u>	4.82	25.9	4.84	25.8	<u>4.82</u>	<u>25.9</u>	4.82	25.9
104.lbm	<u>4.25</u>	<u>26.3</u>	4.25	26.3	4.29	26.1	4.24	26.4	<u>4.27</u>	<u>26.2</u>	4.27	26.2
110.fft	4.46	24.9	<u>4.47</u>	<u>24.8</u>	4.48	24.8	4.46	24.9	<u>4.47</u>	<u>24.8</u>	4.48	24.8
112.spmv	12.5	11.8	12.5	11.7	<u>12.5</u>	<u>11.8</u>	12.5	11.8	12.5	11.8	<u>12.5</u>	<u>11.8</u>
114.mriq	<u>2.73</u>	<u>39.9</u>	2.68	40.6	2.74	39.7	<u>2.73</u>	<u>39.9</u>	2.68	40.6	2.74	39.7
116.histo	32.5	3.50	33.9	3.36	<u>33.2</u>	<u>3.43</u>	32.5	3.50	33.9	3.36	<u>33.2</u>	<u>3.43</u>
117.bfs	5.36	21.8	5.33	22.0	<u>5.35</u>	<u>21.9</u>	<u>5.85</u>	<u>20.0</u>	5.87	19.9	5.83	20.1
118.cutcp	<u>3.36</u>	<u>29.5</u>	3.39	29.2	3.34	29.6	<u>3.36</u>	<u>29.5</u>	3.39	29.2	3.34	29.6
120.kmeans	31.5	3.17	31.9	3.14	<u>31.6</u>	<u>3.17</u>	<u>31.6</u>	<u>3.16</u>	31.7	3.15	31.6	3.17
121.lavamd	4.44	24.5	<u>4.53</u>	<u>24.0</u>	4.58	23.8	4.44	24.5	<u>4.53</u>	<u>24.0</u>	4.58	23.8
122.cfd	8.17	15.4	8.21	15.4	<u>8.19</u>	<u>15.4</u>	8.10	15.6	8.06	15.6	<u>8.10</u>	<u>15.6</u>
123.nw	13.8	8.31	14.0	8.19	<u>13.9</u>	<u>8.27</u>	13.8	8.31	14.0	8.19	<u>13.9</u>	<u>8.27</u>
124.hotspot	<u>5.75</u>	<u>19.8</u>	5.71	20.0	5.80	19.6	<u>5.75</u>	<u>19.8</u>	5.71	20.0	5.80	19.6
125.lud	<u>9.02</u>	<u>13.2</u>	9.01	13.2	9.02	13.2	<u>5.96</u>	<u>20.0</u>	5.92	20.1	5.98	19.9
126.ge	<u>6.27</u>	<u>24.7</u>	6.27	24.7	6.27	24.7	<u>0.945</u>	<u>164</u>	0.948	163	0.934	166
127.srad	8.01	14.2	<u>8.01</u>	<u>14.2</u>	8.01	14.2	8.01	14.2	<u>8.01</u>	<u>14.2</u>	8.01	14.2
128.heartwall	8.75	12.1	<u>8.68</u>	<u>12.2</u>	8.67	12.2	8.75	12.1	<u>8.68</u>	<u>12.2</u>	8.67	12.2
140.bplustree	6.09	17.7	6.07	17.8	<u>6.09</u>	<u>17.7</u>	6.09	17.7	6.07	17.8	<u>6.09</u>	<u>17.7</u>

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 amd2srh833 Tue May 11 20:26:42 2021
```

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 7763 64-Core Processor
```

Continued on next page



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## Platform Notes (Continued)

```

1 "physical id"s (chips)
64 "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 : 64
siblings  : 64
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46
47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
cache size : 512 KB

```

```

From /proc/meminfo
MemTotal:      263708564 kB
HugePages_Total: 0
Hugepagesize:  2048 kB

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux"
VERSION="8.3 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.3"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

```

```

uname -a:
Linux amd2srh833 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020
x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Jan 13 11:28

```

SPEC is set to: /home/ACCEL1.3
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda3       xfs   419G  76G  343G  19% /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 CFE125L 03/26/2021  
Memory:

Continued on next page



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## Platform Notes (Continued)

8x Samsung M393A4G43AB3-CWE 32 GB 2 rank 3200 MT/s  
8x Unknown Unknown

(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: A100-PCIE-40GB, v 450.51.05

C++ benchmarks:

OpenCL Platform: NVIDIA CUDA, OpenCL 1.2 CUDA 11.0.197  
OpenCL Device #0: A100-PCIE-40GB, v 450.51.05

## 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 -Mstack\_arrays -Mnouniform -Mfprelaxed

Continued on next page



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## Base Optimization Flags (Continued)

C++ benchmarks:  
-fast -Mstack\_arrays -Mnouniform -Mfprelaxed

## Base Other Flags

C benchmarks:  
-I/usr/local/cuda-11.0/include -L/usr/local/cuda-11.0/lib64 -lOpenCL

C++ benchmarks:  
-I/usr/local/cuda-11.0/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: A100-PCIE-40GB, v 450.51.05

C++ benchmarks:  
OpenCL Platform: NVIDIA CUDA, OpenCL 1.2 CUDA 11.0.197  
OpenCL Device #0: A100-PCIE-40GB, v 450.51.05

## Peak Compiler Invocation

C benchmarks:  
nvc

C++ benchmarks:  
nvc++

## Peak Portability Flags

116.histo: -DSPEC\_LOCAL\_MEMORY\_HEADROOM=1

## Peak Optimization Flags

C benchmarks:

Continued on next page



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## Peak Optimization Flags (Continued)

110.fft: basepeak = yes

114.mriq: basepeak = yes

116.histo: basepeak = yes

117.bfs: -fast -Mstack\_arrays -Mnouniform -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 -Mstack\_arrays -Mnouniform -Mfprelaxed  
-DSPEC\_ACCEL\_WG\_SIZE\_0\_0=1024

103.stencil: basepeak = yes

104.lbm: -fast -Mstack\_arrays -Mnouniform -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 -Mstack\_arrays -Mnouniform -Mfprelaxed  
-DSPEC\_ACCEL\_WG\_SIZE\_0\_0=96

120.kmeans: -fast -Mstack\_arrays -Mnouniform -Mfprelaxed  
-DSPEC\_ACCEL\_WG\_SIZE\_0\_0=288

122.cfd: -fast -Mstack\_arrays -Mnouniform -Mfprelaxed  
-DSPEC\_ACCEL\_WG\_SIZE\_3\_0=288

123.nw: basepeak = yes

125.lud: -fast -Mstack\_arrays -Mnouniform -Mfprelaxed  
-DSPEC\_ACCEL\_WG\_SIZE\_0\_0=32

126.ge: -fast -Mstack\_arrays -Mnouniform -Mfprelaxed  
-DSPEC\_ACCEL\_WG\_SIZE\_0\_0=512 -DSPEC\_ACCEL\_WG\_SIZE\_1\_0=1  
-DSPEC\_ACCEL\_WG\_SIZE\_1\_1=512



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## Peak Other Flags

C benchmarks:  
-I/usr/local/cuda-11.0/include -L/usr/local/cuda-11.0/lib64 -lOpenCL  
C++ benchmarks:  
-I/usr/local/cuda-11.0/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/nvidia\\_flags.20210608.html](https://www.spec.org/accel/flags/nvidia_flags.20210608.html)

You can also download the XML flags source by saving the following link:  
[https://www.spec.org/accel/flags/nvidia\\_flags.20210608.xml](https://www.spec.org/accel/flags/nvidia_flags.20210608.xml)

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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).

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