



SPECaccel[®]2023 Result

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NVIDIA Corporation
Tesla H100 96GB
MGX-GH200

SPECaccel2023_base = 5.74

SPECaccel2023_peak = 5.74

accel2023 License: 9045

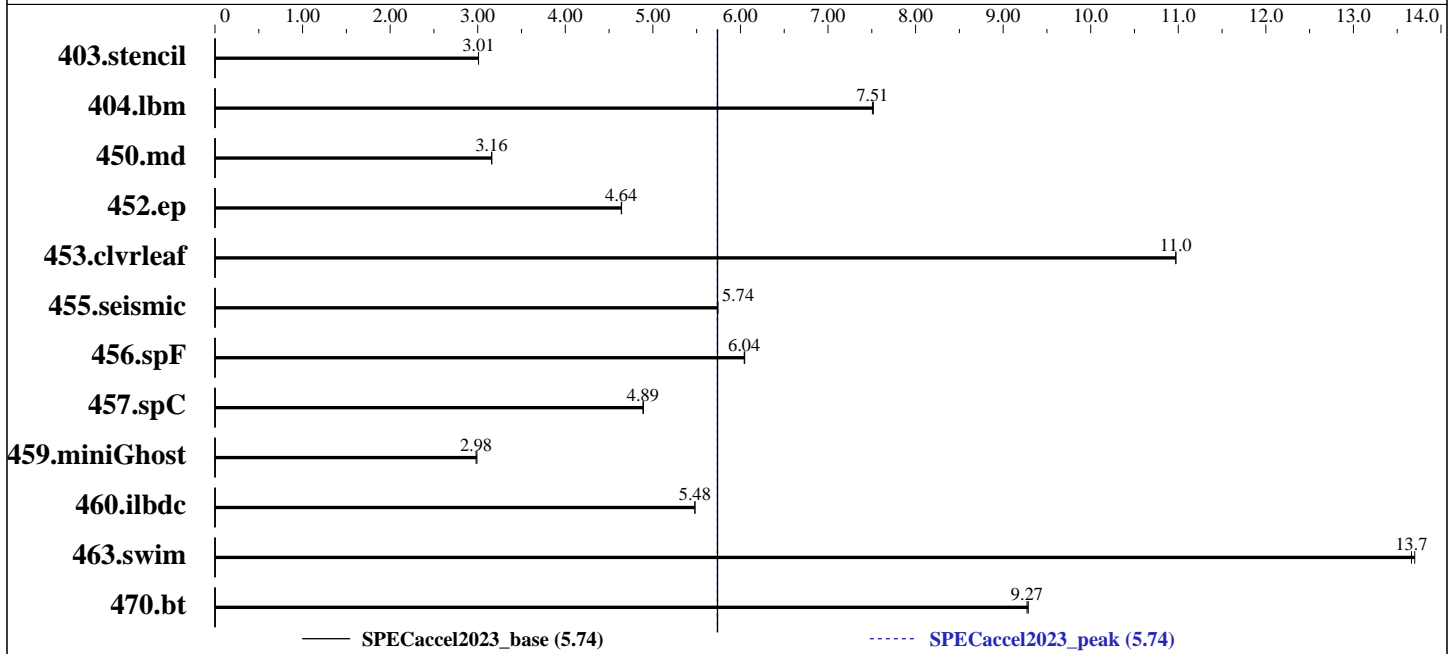
Test Sponsor: NVIDIA Corporation

Tested by: NVIDIA Corporation

Test Date: Oct-2023

Hardware Availability: Sep-2023

Software Availability: Nov-2023



Hardware

CPU Name: Grace
 Max MHz.: 3100
 Nominal: 2900
 Enabled: 72 cores, 1 chip
 Orderable: 1 chip
 Cache L1: 64 KB I + 64 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 117 MB I+D on chip per chip
 Other: None
 Memory: 480 GB (1 x 480 GB LPDDR5)
 Storage: 1.8 TB NVMe
 Other: None
 Base Threads Run: 1
 Min. Peak Threads: 1
 Max. Peak Threads: 1

Accelerator

Accel Model Name: H100 96GB
 Accel Vendor: NVIDIA Corporation
 Accel Name: Tesla H100 96GB
 Type of Accel: GPU
 Accel Connection: NVLink-C2C
 Does Accel Use ECC: Yes
 Accel Description: Grace Hopper Superchip w/ 96GB device memory
 Accel Driver: NVIDIA UNIX Open Kernel Module for aarch64 525.105.17

Software

OS: Ubuntu 22.04.3 LTS
 6.2.0-1010-nvidia-64k
 Compiler: C/Fortran: Version 23.11 NVHPC SDK
 Firmware: NVIDIA 00010001 09/21/2023
 File System: ext4
 System State: Run level 3 (multi-user)
 Other: None
 Base Parallel Model: LOP
 Base Threads Run: 1
 Peak Parallel Models: LOP

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Software (Continued)

Max. Peak Threads: 1
Min. Peak Threads: 1

Results Table

Benchmark	Base							Peak						
	Model	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Model	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
403.stencil	LOP	146	3.01	<u>146</u>	<u>3.01</u>			LOP	146	3.01	<u>146</u>	<u>3.01</u>		
404.lbm	LOP	<u>60.6</u>	<u>7.51</u>	60.5	7.52			LOP	<u>60.6</u>	<u>7.51</u>	60.5	7.52		
450.md	LOP	<u>190</u>	<u>3.16</u>	190	3.16			LOP	<u>190</u>	<u>3.16</u>	190	3.16		
452.ep	LOP	<u>89.5</u>	<u>4.64</u>	89.4	4.64			LOP	<u>89.5</u>	<u>4.64</u>	89.4	4.64		
453.civrleaf	LOP	<u>91.1</u>	<u>11.0</u>	91.1	11.0			LOP	<u>91.1</u>	<u>11.0</u>	91.1	11.0		
455.seismic	LOP	<u>136</u>	<u>5.74</u>	136	5.74			LOP	<u>136</u>	<u>5.74</u>	136	5.74		
456.spF	LOP	<u>78.6</u>	<u>6.04</u>	78.5	6.05			LOP	<u>78.6</u>	<u>6.04</u>	78.5	6.05		
457.spC	LOP	110	4.89	<u>111</u>	<u>4.89</u>			LOP	110	4.89	<u>111</u>	<u>4.89</u>		
459.miniGhost	LOP	197	2.99	<u>198</u>	<u>2.98</u>			LOP	197	2.99	<u>198</u>	<u>2.98</u>		
460.ilbdc	LOP	101	5.48	<u>101</u>	<u>5.48</u>			LOP	101	5.48	<u>101</u>	<u>5.48</u>		
463.swim	LOP	32.1	13.7	<u>32.2</u>	<u>13.7</u>			LOP	32.1	13.7	<u>32.2</u>	<u>13.7</u>		
470.bt	LOP	114	9.29	<u>114</u>	<u>9.27</u>			LOP	114	9.29	<u>114</u>	<u>9.27</u>		

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

Operating System Notes

Shell stacksize set to unlimited via "limit stacksize unlimited"

General Notes

Environment variables set by runaccel before the start of the run:
LD_LIBRARY_PATH = "/var/data0/sandbox/nvuser/SPECACCEL/nv239_libs"
Set to the location of the NVHPC compiler runtime libraries.

Platform Notes

Sysinfo program /var/data0/sandbox/nvuser/mcolgrove/ACCELv2/bin/sysinfo
Rev: r6622 of 2021-04-07 b1a7d5f8f71be5aff70a755cad7211a0
running on LegoCG1-96GB-QS-102 Tue Oct 17 01:53:46 2023

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
<https://www.spec.org/cpu2017/Docs/config.html#sysinfo>

From /proc/cpuinfo

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Platform Notes (Continued)

*
 * Did not identify cpu model. If you would
 * like to write your own sysinfo program, see
 * www.spec.org/cpu2017/config.html#sysinfo
 *
 *
 * 0 "physical id" tags found. Perhaps this is an older system,
 * or a virtualized system. Not attempting to guess how to
 * count chips/cores for this system.
 *
 72 "processors"
 cores, siblings (Caution: counting these is hw and system dependent. The following
 excerpts from /proc/cpuinfo might not be reliable. Use with caution.)

From lscpu from util-linux 2.37.2:

```

Architecture:                aarch64
CPU op-mode(s):              64-bit
Byte Order:                  Little Endian
CPU(s):                      72
On-line CPU(s) list:        0-71
Vendor ID:                   ARM
Model:                       0
Thread(s) per core:         1
Core(s) per socket:         72
Socket(s):                   1
Stepping:                    r0p0
Frequency boost:             disabled
CPU max MHz:                 3429.0000
CPU min MHz:                 81.0000
BogoMIPS:                    2000.00
Flags:                       fp asimd evtstrm aes pmull sha1 sha2 crc32
                             atomics fphp asimdhp cpuid asimdrdm jscvt fcma lrcpc dcpop sha3 sm3 sm4 asimddp
                             sha512 sve asimdfhm dit uscat ilrcpc flagm ssbs sb paca pacg dcpodp sve2 sveaes
                             svepmull svebitperm svesha3 svesm4 flagm2 frint svei8mm svebfl6 i8mm bfl6 dgh bti
L1d cache:                   4.5 MiB (72 instances)
L1i cache:                   4.5 MiB (72 instances)
L2 cache:                    72 MiB (72 instances)
L3 cache:                    114 MiB (1 instance)
NUMA node(s):               9
NUMA node0 CPU(s):          0-71
NUMA node1 CPU(s):
NUMA node2 CPU(s):
NUMA node3 CPU(s):
NUMA node4 CPU(s):
NUMA node5 CPU(s):
NUMA node6 CPU(s):
NUMA node7 CPU(s):

```

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Platform Notes (Continued)

```

NUMA node8 CPU(s):
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit:          Not affected
Vulnerability Lltf:                   Not affected
Vulnerability Mds:                    Not affected
Vulnerability Meltdown:               Not affected
Vulnerability Mmio stale data:        Not affected
Vulnerability Retbleed:               Not affected
Vulnerability Spec store bypass:      Mitigation; Speculative Store Bypass disabled
via prctl
Vulnerability Spectre v1:              Mitigation; __user pointer sanitization
Vulnerability Spectre v2:            Not affected
Vulnerability Srbds:                  Not affected
Vulnerability Tsx async abort:        Not affected

```

From lscpu --cache:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	64K	4.5M	4	Data	1	256		64
L1i	64K	4.5M	4	Instruction	1	256		64
L2	1M	72M	8	Unified	2	2048		64
L3	114M	114M	12	Unified	3	155648		64

From numactl --hardware

WARNING: a numactl 'node' might or might not correspond to a physical chip.

```

available: 9 nodes (0-8)
node 0 cpus: 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 64 65 66 67 68 69 70 71
node 0 size: 490308 MB
node 0 free: 76379 MB
node 1 cpus:
node 1 size: 97280 MB
node 1 free: 96966 MB
node 2 cpus:
node 2 size: 0 MB
node 2 free: 0 MB
node 3 cpus:
node 3 size: 0 MB
node 3 free: 0 MB
node 4 cpus:
node 4 size: 0 MB
node 4 free: 0 MB
node 5 cpus:
node 5 size: 0 MB
node 5 free: 0 MB
node 6 cpus:
node 6 size: 0 MB

```

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Platform Notes (Continued)

```

node 6 free: 0 MB
node 7 cpus:
node 7 size: 0 MB
node 7 free: 0 MB
node 8 cpus:
node 8 size: 0 MB
node 8 free: 0 MB
node distances:
node  0  1  2  3  4  5  6  7  8
0:  10  80  80  80  80  80  80  80  80
1:  80  10  255  255  255  255  255  255  255
2:  80  255  10  255  255  255  255  255  255
3:  80  255  255  10  255  255  255  255  255
4:  80  255  255  255  10  255  255  255  255
5:  80  255  255  255  255  10  255  255  255
6:  80  255  255  255  255  255  10  255  255
7:  80  255  255  255  255  255  255  10  255
8:  80  255  255  255  255  255  255  255  10

```

```

From /proc/meminfo
MemTotal:      601690240 kB
HugePages_Total:      0
Hugepagesize:    524288 kB

```

```

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
performance

```

```

/usr/bin/lsb_release -d
Ubuntu 22.04.3 LTS

```

```

From /etc/*release* /etc/*version*
debian_version: bookworm/sid
l4t-release:
  L4T_NAME="L4T Server"
  L4T_PRETTY_NAME="NVIDIA L4T Server"
  L4T_SWBUILD_DATE="2023-09-12-19-18-30"
  L4T_SWBUILD_VERSION="6.0.0-nvidia"
  L4T_COMMIT_ID="3244539"
  L4T_PLATFORM=" "
  L4T_SERIAL_NUMBER=" "
os-release:
  PRETTY_NAME="Ubuntu 22.04.3 LTS"
  NAME="Ubuntu"
  VERSION_ID="22.04"
  VERSION="22.04.3 LTS (Jammy Jellyfish)"
  VERSION_CODENAME=jammy
  ID=ubuntu

```

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Platform Notes (Continued)

ID_LIKE=debian
HOME_URL="https://www.ubuntu.com/"

```
uname -a:
Linux LegoCG1-96GB-QS-102 6.2.0-1010-nvidia-64k #10-Ubuntu SMP PREEMPT_DYNAMIC Wed Aug
30 06:23:50 UTC 2023 aarch64 aarch64 aarch64 GNU/Linux
```

Kernel self-reported vulnerability status:

gather_data_sampling:	Not affected
CVE-2018-12207 (iTLB Multihit):	Not affected
CVE-2018-3620 (L1 Terminal Fault):	Not affected
Microarchitectural Data Sampling:	Not affected
CVE-2017-5754 (Meltdown):	Not affected
mmio_stale_data:	Not affected
retbleed:	Not affected
CVE-2018-3639 (Speculative Store Bypass):	Mitigation: Speculative Store Bypass disabled via prctl
CVE-2017-5753 (Spectre variant 1):	Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):	Not affected
CVE-2020-0543 (Special Register Buffer Data Sampling):	Not affected
CVE-2019-11135 (TSX Asynchronous Abort):	Not affected

```
run-level 3 Oct 14 00:07
```

```
SPEC is set to: /var/data0/sandbox/nvuser/mcolgrove/ACCELv2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/nvme0n1p2 ext4  1.8T  1.5T  200G  89% /
```

```
Cannot run dmidecode; consider saying (as root)
chmod +s /usr/sbin/dmidecode
```

```
BIOS:
  BIOS Vendor:      NVIDIA
  BIOS Version:     00010001
  BIOS Date:        20230921
```

(End of data from sysinfo program)

Compiler Version Notes

```
=====
C          | 403.stencil(base) 404.lbm(base) 452.ep(base) 470.bt(base)
-----
nvc Rel Dev-r238862 linuxarm64 target on aarch64 Linux -tp neoverse-v2
```

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Compiler Version Notes (Continued)

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=====
C | 457.spC(base)

nvc-Warning-Only small, tiny and large code models are allowed on AArch64.
The code model large will be used.
/usr/bin/ld: /usr/lib/aarch64-linux-gnu/crt1.o: in function `__wrap_main':
(.text+0x38): undefined reference to `main'
pgacclnk: child process exit status 1: /usr/bin/ld
nvc Rel Dev-r238862 linuxarm64 target on aarch64 Linux -tp neoverse-v2
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=====
C | 403.stencil(base) 404.lbm(base) 452.ep(base) 470.bt(base)

nvc Rel Dev-r238862 linuxarm64 target on aarch64 Linux -tp neoverse-v2
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=====
C | 457.spC(base)

nvc-Warning-Only small, tiny and large code models are allowed on AArch64.
The code model large will be used.
/usr/bin/ld: /usr/lib/aarch64-linux-gnu/crt1.o: in function `__wrap_main':
(.text+0x38): undefined reference to `main'
pgacclnk: child process exit status 1: /usr/bin/ld
nvc Rel Dev-r238862 linuxarm64 target on aarch64 Linux -tp neoverse-v2
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=====
Fortran | 450.md(base) 455.seismic(base) 456.spF(base) 460.ilbdc(base)
463.swim(base)

nvfortran Rel Dev-r238862 linuxarm64 target on aarch64 Linux -tp neoverse-v2
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Compiler Version Notes (Continued)

=====
Fortran, C | 453.clvrleaf(base) 459.miniGhost(base)
=====

nvfortran Rel Dev-r238862 linuxarm64 target on aarch64 Linux -tp neoverse-v2
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nvc Rel Dev-r238862 linuxarm64 target on aarch64 Linux -tp neoverse-v2
NVIDIA Compilers and Tools
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=====

Base Compiler Invocation

C benchmarks:
nvc

Fortran benchmarks:
nvfortran

Benchmarks using both Fortran and C:
nvfortran nvc

Base Portability Flags

403.stencil: -DSPEC_NO_NOTHING
457.spC: -mcmmodel=medium -Wl,--no-relax

Base Optimization Flags

C benchmarks:
-Ofast -mp=gpu -Mfprelaxed -Mstack_arrays -static-nvidia
-march=neoverse-v2

Fortran benchmarks:
-Ofast -mp=gpu -Mfprelaxed -Mstack_arrays -static-nvidia
-march=neoverse-v2

Benchmarks using both Fortran and C:

453.clvrleaf: -Ofast -mp=gpu -Mfprelaxed -Mstack_arrays -static-nvidia
-march=neoverse-v2

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Base Optimization Flags (Continued)

459.miniGhost: -Mnomain -Ofast -mp=gpu -Mfprelaxed -Mstack_arrays
-static-nvidia -march=neoverse-v2

Peak Optimization Flags

C benchmarks:

403.stencil: basepeak = yes

404.lbm: basepeak = yes

452.ep: basepeak = yes

457.spC: basepeak = yes

470.bt: basepeak = yes

Fortran benchmarks:

450.md: basepeak = yes

455.seismic: basepeak = yes

456.spF: basepeak = yes

460.ilbdc: basepeak = yes

463.swim: basepeak = yes

Benchmarks using both Fortran and C:

453.clvleaf: basepeak = yes

459.miniGhost: basepeak = yes

The flags file that was used to format this result can be browsed at

http://www.spec.org/accel2023/flags/nv2023_flags_v2_arm.html

You can also download the XML flags source by saving the following link:

http://www.spec.org/accel2023/flags/nv2023_flags_v2_arm.xml



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

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