



SPECaccel[®]2023 Result

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Supermicro
(Test Sponsor: NVIDIA Corporation)

Tesla V100-PCIE-16GB
SuperServer SYS-1029GQ-TRT

SPECaccel2023_base = 0.9990

SPECaccel2023_peak = 0.9990

accel2023 License: 9045

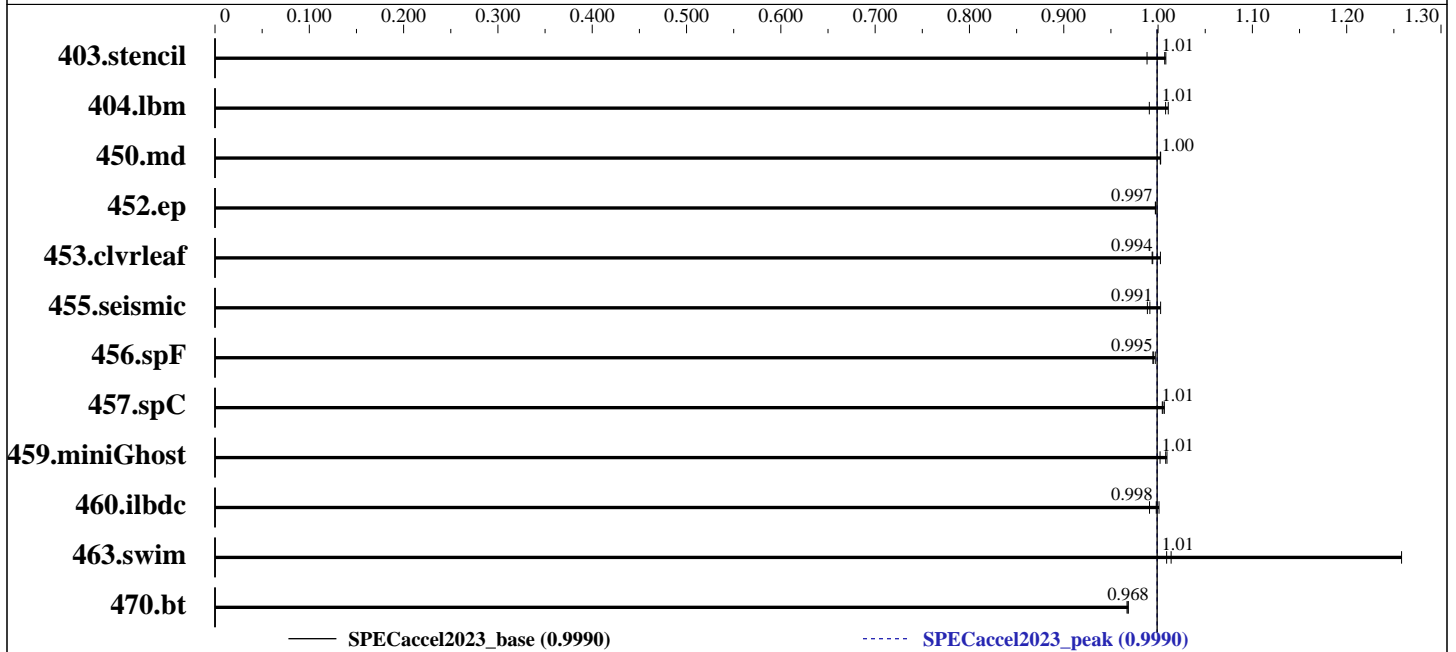
Test Sponsor: NVIDIA Corporation

Tested by: NVIDIA Corporation

Test Date: Oct-2023

Hardware Availability: Feb-2018

Software Availability: Oct-2023



Hardware

CPU Name: Intel Xeon Gold 6148
 Max MHZ.: 3700
 Nominal: 2400
 Enabled: 40 cores, 2 chips, 2 threads/core
 Orderable: 2 chips
 Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 28160 KB I+D on chip per chip
 Other: None
 Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R)
 Storage: 440 GB SATA
 Other: None
 Base Threads Run: 1
 Min. Peak Threads: 1
 Max. Peak Threads: 1

Accelerator

Accel Model Name: Tesla V100
 Accel Vendor: NVIDIA
 Accel Name: Tesla V100-PCIE-16GB
 Type of Accel: GPU
 Accel Connection: PCIe 3.0 x 16
 Does Accel Use ECC: Yes
 Accel Description: See Notes
 Accel Driver: NVIDIA UNIX x86_64 Kernel Module 465.19.01

Software

OS: Ubuntu 18.04.2 LTS
 4.15.0-50-generic
 Compiler: C/Fortran: Version 23.9 of NVIDIA NVHPC SDK
 Firmware: American Megatrends Inc. 3.2 11/07/2019
 File System: ext4
 System State: Run level 5 (multi-user)
 Other: None
 Base Parallel Model: TGT
 Base Threads Run: 1
 Peak Parallel Models: TGT

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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	TGT	436	1.01	<u>437</u>	<u>1.01</u>	445	0.988	TGT	436	1.01	<u>437</u>	<u>1.01</u>	445	0.988
404.lbm	TGT	450	1.01	<u>451</u>	<u>1.01</u>	459	0.991	TGT	450	1.01	<u>451</u>	<u>1.01</u>	459	0.991
450.md	TGT	598	1.00	<u>599</u>	<u>1.00</u>	599	1.00	TGT	598	1.00	<u>599</u>	<u>1.00</u>	599	1.00
452.ep	TGT	416	0.997	416	0.998	<u>416</u>	<u>0.997</u>	TGT	416	0.997	416	0.998	<u>416</u>	<u>0.997</u>
453.cvrleaf	TGT	998	1.00	<u>1006</u>	<u>0.994</u>	1006	0.994	TGT	998	1.00	<u>1006</u>	<u>0.994</u>	1006	0.994
455.seismic	TGT	778	1.00	789	0.989	<u>787</u>	<u>0.991</u>	TGT	778	1.00	789	0.989	<u>787</u>	<u>0.991</u>
456.spF	TGT	476	0.997	<u>477</u>	<u>0.995</u>	478	0.995	TGT	476	0.997	<u>477</u>	<u>0.995</u>	478	0.995
457.spC	TGT	538	1.00	<u>537</u>	<u>1.01</u>	536	1.01	TGT	538	1.00	<u>537</u>	<u>1.01</u>	536	1.01
459.miniGhost	TGT	<u>585</u>	<u>1.01</u>	584	1.01	589	1.00	TGT	<u>585</u>	<u>1.01</u>	584	1.01	589	1.00
460.ilbdc	TGT	<u>556</u>	<u>0.998</u>	554	1.00	560	0.991	TGT	<u>556</u>	<u>0.998</u>	554	1.00	560	0.991
463.swim	TGT	<u>434</u>	<u>1.01</u>	350	1.26	436	1.01	TGT	<u>434</u>	<u>1.01</u>	350	1.26	436	1.01
470.bt	TGT	<u>1090</u>	<u>0.968</u>	1090	0.968	1091	0.967	TGT	<u>1090</u>	<u>0.968</u>	1090	0.968	1091	0.967

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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"

Platform Notes

Information from nvaccelinfo

```

CUDA Driver Version:      11030
NVRM version:            NVIDIA UNIX x86_64 Kernel Module  465.19.01  Fri Mar 19 07:44:41 UTC 2021
Device Number:          0
Device Name:             NVIDIA Tesla V100-PCIE-16GB
Device Revision Number:  7.0
Global Memory Size:     16945512448
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

```

(Continued on next page)



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Platform Notes (Continued)

```

Texture Alignment:          512B
Clock Rate:                 1380 MHz
Execution Timeout:         No
Integrated Device:         No
Can Map Host Memory:       Yes
Compute Mode:              default
Concurrent Kernels:        Yes
ECC Enabled:               Yes
Memory Clock Rate:         877 MHz
Memory Bus Width:          4096 bits
L2 Cache Size:             6291456 bytes
Max Threads Per SMP:       2048
Async Engines:             7
Unified Addressing:        Yes
Managed Memory:           Yes
Concurrent Managed Memory: Yes
Preemption Supported:      Yes
Cooperative Launch:        Yes
Default Target:            cc70

```

```

Sysinfo program /local/home/mcolgrove/ACCELv2b/bin/sysinfo
Rev: r6622 of 2021-04-07 bla7d5f8f71be5aff70a755cad7211a0
running on dev-sky5 Thu Oct 12 11:53:15 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
model name : Intel(R) Xeon(R) Gold 6148 CPU @ 2.40GHz
 2 "physical id"s (chips)
 80 "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 : 20
siblings  : 40
physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

```

```

From lscpu from util-linux 2.31.1:
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                 80
On-line CPU(s) list:   0-79
Thread(s) per core:    2
Core(s) per socket:    20

```

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Platform Notes (Continued)

```

Socket(s):                2
NUMA node(s):            2
Vendor ID:               GenuineIntel
CPU family:              6
Model:                   85
Model name:              Intel(R) Xeon(R) Gold 6148 CPU @ 2.40GHz
Stepping:                4
CPU MHz:                 1000.909
CPU max MHz:             2401.0000
CPU min MHz:             1000.0000
BogoMIPS:                4800.00
Virtualization:         VT-x
L1d cache:               32K
L1i cache:               32K
L2 cache:                1024K
L3 cache:                28160K
NUMA node0 CPU(s):      0-19,40-59
NUMA node1 CPU(s):      20-39,60-79
Flags:                   fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc art arch_perfmon pebs rep_good nopl xtopology nonstop_tsc cpuid
aperfmpperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3
invpcid_single pti intel_ppin ssbd mba ibrs ibpb stibp tpr_shadow vnmi flexpriority
ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
dtherm ida arat pln pts pku ospke md_clear flush_l1d

```

```
/proc/cpuinfo cache data
cache size : 28160 KB
```

```
Unable to get information from 'numactl --hardware'
Please verify numactl installation.
```

```
From /proc/meminfo
MemTotal:          394882320 kB
HugePages_Total:    0
Hugepagesize:      2048 kB
```

```
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
ondemand
```

```
/usr/bin/lsb_release -d
Ubuntu 18.04.2 LTS
```

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Platform Notes (Continued)

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

```
debian_version: buster/sid
os-release:
  NAME="Ubuntu"
  VERSION="18.04.2 LTS (Bionic Beaver)"
  ID=ubuntu
  ID_LIKE=debian
  PRETTY_NAME="Ubuntu 18.04.2 LTS"
  VERSION_ID="18.04"
  HOME_URL="https://www.ubuntu.com/"
  SUPPORT_URL="https://help.ubuntu.com/"
```

uname -a:

```
Linux dev-sky5 4.15.0-50-generic #54-Ubuntu SMP Mon May 6 18:46:08 UTC 2019 x86_64
x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit):	No status reported
CVE-2018-3620 (L1 Terminal Fault):	Mitigation: PTE Inversion; VMX: conditional cache flushes, SMT vulnerable
Microarchitectural Data Sampling:	Mitigation: Clear CPU buffers; SMT vulnerable
CVE-2017-5754 (Meltdown):	Mitigation: PTI
CVE-2018-3639 (Speculative Store Bypass):	Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):	Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):	Mitigation: Full generic retpoline, IBPB: conditional, IBRS_FW, STIBP: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling):	No status reported
CVE-2019-11135 (TSX Asynchronous Abort):	No status reported

run-level 5 Oct 12 10:32

SPEC is set to: /local/home/mcolgrove/ACCELv2b
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda1 ext4 440G 281G 137G 68% /

From /sys/devices/virtual/dmi/id
Vendor: Supermicro
Product: SYS-1029GQ-TRT
Product Family: SMC X11

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Platform Notes (Continued)

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

BIOS:
BIOS Vendor: American Megatrends Inc.
BIOS Version: 3.2
BIOS Date: 11/07/2019

(End of data from sysinfo program)

Compiler Version Notes

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

/usr/lib/x86_64-linux-gnu/crt1.o: In function `_start':
(.text+0x20): undefined reference to `main'
pgacclnk: child process exit status 1: /usr/bin/ld
nvc Rel Dev-r238684 64-bit target on x86-64 Linux -tp skylake-avx512
NVIDIA Compilers and Tools
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=====

=====
C | 452.ep(base)
=====

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=====

=====
C | 403.stencil(base) 404.lbm(base) 470.bt(base)
=====

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=====

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

/usr/lib/x86_64-linux-gnu/crt1.o: In function `_start':
(.text+0x20): undefined reference to `main'
pgacclnk: child process exit status 1: /usr/bin/ld

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Compiler Version Notes (Continued)

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=====
C | 452.ep(base)

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C | 452.ep(base)

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C | 403.stencil(base) 404.lbm(base) 470.bt(base)

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Compiler Version Notes (Continued)

=====
Fortran | 456.spF(base)

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=====
Fortran | 450.md(base) 455.seismic(base) 460.ilbdc(base) 463.swim(base)

nvfortran Rel Dev-r238691 64-bit target on x86-64 Linux -tp skylake-avx512
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=====
Fortran | 456.spF(base)

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Fortran | 450.md(base) 455.seismic(base) 460.ilbdc(base) 463.swim(base)

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

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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:

-fast -mp=gpu

Fortran benchmarks:

-fast -mp=gpu

Benchmarks using both Fortran and C:

453.clvleaf: -fast -mp=gpu

459.miniGhost: -Mnomain -fast -mp=gpu

Peak Optimization Flags

C benchmarks:

403.stencil: basepeak = yes

404.lbm: basepeak = yes

452.ep: basepeak = yes

457.spC: basepeak = yes

(Continued on next page)



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Peak Optimization Flags (Continued)

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.cvrleaf: 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/nv2021_flags_v1.0.3.html

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

http://www.spec.org/accel2023/flags/nv2021_flags_v1.0.3.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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